Proecdings of the
Pacific Energy Ministers’ Meeting and
Regional Energy Officials’ Meeting

20 - 24 April 2009

Fa’onelua Convention Centre, Nuku’alofa, Tonga

Strengthening the Fragile Pacific Islands Energy Sector –
Addressing energy, economy and environment in a period of rapid change
This publication can also be referred to as SOPAC Joint Contribution Report 200
Proceedings of the
Pacific Energy Ministers’ Meeting and Regional Energy Officials’ Meeting

Fa’onelua Convention Centre, Nuku’alofa, Tonga
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Strengthening the Fragile Pacific Islands Energy Sector — Addressing energy, economy and environment in a period of rapid change

September 2009
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Recognising, that strengthening the fragile Pacific Islands energy sector through addressing energy, economy, and environment in a period of rapid change, that energy security is an imperative for economic growth and human development and further that Pacific economies are the most vulnerable in the world to rising oil prices and the urgent need to reduce this vulnerability through mainstreaming energy security into national planning and budgetary process; improving energy efficiency and energy conservation; adopting financially viable renewable energy sources; and where appropriate regional approaches to petroleum procurement and coordination of regional services.

We declare that on behalf of our governments, we endorse the Communiqué developed during the Pacific Regional Energy Ministers’ meeting held in Nuku’alofa, Kingdom of Tonga, 23-24 April 2009, and attached to this Declaration:

Mr Brendan Morling  
(for the Minister for Resources and Energy)  
Department of Resources, Energy and Tourism  
Australia

Honourable Tangata Vavia  
Minister of Energy  
Cook Islands

Honourable Timoci Natuva  
Minister for Works, Transport and Public Utilities  
Republic of the Fiji Islands

Mr Kireua B Kaiea  
Minister for Works and Energy  
Republic of Kiribati
Honourable Fredrick Pitcher
Minister of Commerce, Industry & Environment
Republic of Nauru

Honourable Gerry Brownlee
Minister of Energy and Natural Resources
New Zealand

Honourable Togia Sioneholo
Minister for Bulk Fuels
Niue

Honourable Jackson R Ngiraingas
Minister of Public Infrastructure, Industry and Commerce
Palau

Ms Angeline Abraham
Ministry of Resources and Development
Republic of the Marshall Islands

Honourable Niko Lee Hang
Minister of Finance
Samoa
Honourable Edward Huniehu  
Minister of Mines, Energy and Rural Electrification  
Solomon Islands

Lord Tui  
Minister of Lands, Survey and Natural Resources  
Kingdom of Tonga

Honourable Kausea Natano  
Minister of Public Utilities and Industries  
Tuvalu

Honourable Raoheal Worwor  
Minister of Lands, Geology, Mines, Water Resources, Energy and Environment  
Vanuatu

Secretary Peter Christian  
Department of Resources and Development  
Federated States Micronesia
2009 Pacific Energy Ministers Communiqué

Preamble
The Second Pacific Energy Ministers was held in Nuku'alofa, Kingdom of Tonga, 23rd to 24th April 2009.


Ministers considered that the key actions included in the Pacific Energy Ministers Communiqué (PEMM2007) still remained valid. In noting this, agreed that delivery against these key action areas had been satisfactory and recommended that the PEMM2007 continue to be delivered against by respective CROP Agencies and in parallel with their own energy sector initiatives.

Ministers considered and endorsed the outcomes from the Regional Officials Meeting held from 20th to 23rd. Appreciating that delivery still continues against the PEMM2007 Communiqué.

Ministers identified five key (priority) areas for action.

Key priority action areas:

1. Ministers in noting the progress in the implementation of the Regional Institutional Framework (RIF) and the implications on energy recommended and agreed to the following:
   a. that regional and donor coordination delivery of energy services to Pacific island countries be strengthened and delivered through one energy agency and through one programme contributing to the development of a stronger energy sector and improved service to member countries; and
   b. in this context it was noted that there was a need to ensure that energy policy and climate change policy remained separate where environmental aspects are managed by SPREP and energy sector activities by SPC so as to ensure that the socio-economic aspects of energy were adequately addressed.

2. Ministers underlined the need to strengthen human capacity development initiatives to support national and regional energy programmes including gender mainstreaming; and further noted on going need to focus on development of apprentice schemes for power utilities and alternative energy technologies.

3. Ministers expressed the need to review and as appropriate strengthen national capacity in energy data and information gathering and collation, management, dissemination and, analysis on economics, social and environment to better inform national and regional energy planning and policy choices where this should be incorporated into the one energy agency.

4. Ministers acknowledged progress in the implementation of the regional bulk fuel procurement initiative and called upon CROP agencies to continue to support PICs to move the initiative to implementation.

5. Ministers encouraged the necessary actions that would facilitate investment in sustainable renewable energy technologies and in energy efficiency and energy conservation initiatives.

Ministers in highlighting these five key priority areas acknowledged that all Pacific island countries are individual and unique in their own respect and accepted that the other outcome areas as recommended to the Ministers be individually assessed on a case by case basis as countries deemed necessary and on the availability of human and financial resources.

* Nominated Delegate representing the Minister
ANNEX (to Communiqué)

Regional Energy Officials Meeting 2009
Outcomes
20-22 April, Nuku’alofa, Tonga

Energy Officials draw particular attention to item 15 and its implications to the delivery of regional energy activities in the future.

1. In noting the progress made toward implementing actions under the PEMM2007 Communiqué, energy officials acknowledged the capacity and resource constraints of CROP and national agencies to effectively meet all the commitments identified by Ministers.

2. Energy Officials also noted that the implementation of some priority areas take longer than the period between REMs and therefore a number of activities within the 2007 PEMM Communiqué are work in progress and will continue to be implemented in parallel with any other priority areas identified during the REM 2009.

3. Energy Officials recommended that future Communiqué key action areas should be targeted and achievable, with realistic timeframes, prioritisation, and quantified progress reporting by member countries and CROP agencies, to ensure effective support is provided.

4. Energy Officials urged the CROP to improve internal coordination, cooperation and collaboration mechanisms, and for the Energy Working Group to establish formal links with the Donor Working Group and other development partners and, to work together actively with national agencies and governments to set priorities and secure necessary additional resources to address national needs.

5. Energy Officials expressed the need to review and as appropriate strengthen national capacity in energy data and information gathering and collation, management, dissemination and, analysis on economics, social and environment to better inform national and regional energy planning and policy choices.

6. Energy Officials emphasised the need for national energy policy and action plans, and regulatory frameworks to: incorporate priorities; to be flexible and create space for private sector participation; to include economic analysis of options and funding requirements and responsibilities; to safeguard the environment and livelihoods; and to encourage investment in maintaining ecosystem services that support energy development; in order to ensure that energy initiatives are progressed and national energy targets are realised.

7. Energy Officials acknowledged the need to review the Pacific Islands Energy Policy and its associated action plan, as time and resources allow.

8. Energy Officials endorsed the Pacific Energy and Gender Strategic Action Plan 2009-2014 and recommended that gender be mainstreamed into national and regional energy initiatives.

9. Energy Officials acknowledged progress in the implementation of the regional bulk fuel procurement initiative and called upon CROP agencies to continue to support PICs to move the initiative to implementation inline with the Leaders decision. Energy Officials also noted with interest best practice case studies on rationalisation of petroleum supply and distribution, cost savings achieved, and indicated the need to address the disposal of waste oil.

10. Energy Officials stressed the need for appropriate policies, incentives and programmes to improve energy efficiency and conservation, including focus on minimum energy performance standards and labelling.

11. Energy Officials underlined the need to strengthen human capacity development initiatives to support national and regional energy programmes, and especially to improve the performance of power utilities to be on going and focus on the development of apprentice schemes.

12. Energy Officials encouraged PICs to set voluntary renewable energy and energy efficiency targets consistent with their national development plans and priorities and, share experiences and expertise particularly, on emerging opportunities and lessons learned, including in relation to innovative financing models.
13. Energy Officials acknowledged the Year of Climate Change - 2009, and encouraged national and regional agencies including the CROP EWG to strengthen interactions with climate change discussions, negotiations and processes such as the Pacific Climate Change Roundtable and its mitigation working group.

14. Energy Officials encouraged support to the development of biofuels production and use where economically viable, and acknowledge the need to consider energy and agriculture impacts (particularly food security), as well as the assessment of impacts on the environment.

15. Noted the presentation of the 3 CEOs (SPC, SOPAC and SPREP) on the implementation of the Regional Institutional Framework as it relates to the energy sector and welcomed the directions proposed in paragraphs 10, 14 and 16 of the paper REM09 7.2 (below):

Role of lead agency for coordinating the regional energy sector (SPC)

Paragraph 10 of REM09 7.2

The key role of the lead coordination agency for the regional energy sector is that of providing leadership for, and improving the profile of energy as a key priority sector in the Pacific islands region. In this regard the lead coordination agency will have the following responsibilities:

i. Establish a dedicated long-term senior position in the organisation with funding that is not dependent on project funding to effectively facilitate regional energy sector coordination to raise and maintain the profile of energy at all levels.

ii. Overall responsibility for analysis of trends in the energy sector, issues and challenges, and identity opportunities for strategic engagement by the region at national, regional and the international levels.

iii. Proactively undertake social, economic and policy research and analysis on the energy sector (petroleum, transportation, renewable energy, energy efficiency and energy conservation, energy infrastructure, power) and provide policy responses and strategic solutions to members and key stakeholders, to inform their own decision-making processes.

iv. Coordinate the development of a joint, regional energy sector work-plan with an appropriate M&E and prioritised framework that involves all stakeholders to effectively implement the regional energy policy and plan.

v. Develop and sustain a comprehensive, coordinated and shared approach to data collection, analysis and dissemination in the energy sector.

vi. Develop and sustain a common energy data and information system.

vii. Focal point for development partner interaction and coordinate resource mobilisation and allocation for the delivery of regional energy services.

viii. Establish and facilitate mechanisms that will involve key energy stakeholders in strategic analysis of emerging challenges and opportunities, as well as the oversight, decision-making and I or management of issues in or affecting the energy sector.

Role of implementing organisations and partners

Paragraph 14 of paper REM09 7.2

In this regard:

a. the new environment and resource management organisation (resulting from the integration of the SPREP and SOPAC programmes), as a key stakeholder within the regional energy sector and its programme of work, would implement actions related to renewable energy, energy efficiency and energy conservation. It will also contribute to research and policy work in these areas.

b. PPA will continue its work in the power sector.
c. USP will continue its work on the areas it is involved in on the energy sector.

d. SPC will implement actions in the petroleum area when petroleum functions transfer from PIFS to SPC.

e. Other key stakeholders involved in implementing energy solutions in the region will continue their roles and will actively participate in the improved coordination and implementation of priorities in the regional energy sector.

Taking the coordination mechanism further
Paragraph 16 of REM09 7.2

Cognisant of this issue the CEOs are exploring the option of possibly ‘co-locating’ the various components of their energy programmes in one location to enhance coordination, service delivery and a ‘one-team’ approach. Each agency that is co-located will retain its own organisational identity and integrity in the team.
The Pacific Energy Ministers’ Meeting (PEMM) was held at the Fa’onelua Convention Centre in Nuku’alofa, Kingdom of Tonga, during 23-24 April 2009 following the Regional Energy Officials’ Meeting (REM). Ministerial representatives were in attendance from the Cook Islands, Federated States of Micronesia, Fiji Islands, Nauru, New Zealand, Niue, Palau, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. Designated Officials represented the Ministers of Australia, Kiribati and the Marshall Islands.

A list of participants is attached as Annex A1.

Agenda Item 1 – OPENING SESSION

The Opening Session was graced with the presence of HRH Princess Pilolevu Tuita.

1.1 Welcome (Prayer)
Rev. Dr Ahio of the Free Wesleyan Church offered the Opening Prayer.

1.2 Opening Statement
The Deputy Prime Minister of Tonga, Hon. Viliami T. Tangi delivered the host Government’s opening address. He emphasised that in order to deliver against energy priorities Pacific Island Countries would “undoubtedly need to address the short fall” in their levels of national commitment; ensure that regional coordination mechanisms were aligned to provide optimal support to the national energy sector; and “to look to development and donor partners to augment the necessary resources, support and appropriate technology to achieve these.”

“In light of the Pacific Islands Forum Leaders’ decision to rationalise the functions of SOPAC with the work programmes of SPC and SPREP,” the Deputy Prime Minister indicated Tonga’s support for “either unifying all regional energy units and programmes into one agency; or the co-location of the various energy units and programmes of the CROP agencies in Forum member countries.” For either scenario Tonga registered its interest as a potential host country. The address is appended in full in Annex C.

1.3 Keynote Address
The keynote address was delivered by the Secretary General of the Pacific Islands Forum Secretariat, Mr Tuioloma Neroni Slade. The full text of the address can be found in Annex C.

Mr Slade underscored that the “question of energy, like no other, gives full exposure to the vulnerability of Pacific Island Countries.” He encouraged PICs to grasp the opportunity “to cast energy in the broader context of national development and economic growth;” to consider how better to coordinate the pursuit of energy efficiency and security; and to “balance … big picture
thinking with tangible and immediate responses”. He contended that improving national action to better support efforts in reducing heavy reliance on fossil fuels; and the pursuit of energy efficiency must remain immediate and central objectives in reducing said vulnerability.

Agenda Item 2 – WORKING PROCEDURES & AGENDA

2.1 Adoption of Working Procedures

The outgoing chair of PEMM, Hon. Tangata Vavia, Minister of Energy of the Cook Islands, presided over the adoption of the Working Procedures (in Paper PEMM09.2.1).

2.2 Appointment of PEMM2009 Chair and Vice-Chair

The Minister of Lands, Survey, Natural Resources and Environment, Honourable Lord Tuita, assumed the Chair of PEMM2009 according to procedure.

Tuvalu nominated the Republic of the Marshall Islands to take up the Vice-Chair (seconded by Palau). The nomination was accepted.

2.3 Appointment of Rapporteurs

Ms Lala Bukarau (SOPAC Secretariat) was appointed overall rapporteur for the meeting, supported by the members of the CROP Energy Working Group.

2.4 Appointment of Drafting Committee

To work with the Vice Chair (Marshall Islands), a drafting committee comprising New Zealand, Nauru, Palau and Kiribati was established to supervise the production of the summary record of the meeting and other key outcome documents.

2.5 Adoption of the Agenda

The agenda was adopted as moved by Nauru (seconded by New Zealand); see Annex B.

Agenda Item 3 – REPORTING

3.1 Report on progress with implementation of PEMM2007 Communiqué

On behalf of the CROP Energy Working Group, the SOPAC Secretariat presented the work that was undertaken in the intervening period since the PEMM Communiqué of 2007, and REM2009. Paper PEMM 09.1.3 is also relevant.

A number of countries commended the CROP Energy Working Group for the facilitation of the activities and the good overview on progress, with Nauru giving details on specific areas of benefit particularly in support of the Nauru commitment to be 50% renewable by 2015.

Both Kiribati and Nauru also informed the meeting about recently adopting their first national energy policies.

As moved by the Cook Islands, and seconded by Nauru, Ministers noted the progress made with the implementation of activities within the PEMM2007 Energy Ministers’ Communiqué.

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2 Available on the CD attachment to this Proceedings volume
3 Country statements submitted to the Secretariat are compiled in Annex D
3.2 Presentation of REM2009 recommendations/discussion

The Secretary of the Ministry of Lands, Survey and Natural Resources, as Chair of the Officials’ Meeting, presented the outcomes from the REM 2009. He described them as “common themes that consistently came up” during the Officials’ Meeting pertaining to coordination, constraints to CROP, capacity development at national level and data/information. Additional information on this item was also provided in PEMM Paper 09.3.2.

Nauru voiced the general support for the Officials’ outcomes paper but expressed personal dismay at the loss in momentum of the petroleum bulk procurement initiative after its presentation to the FEMM in late 2008, and the drop in the price of oil. He echoed an earlier point made by Palau that inaccess to a ready supply of cheap fuel was an ongoing concern for the small island states of the central and northern Pacific, where transportation costs are extremely high, and he encouraged other countries to sign up to the initiative.

Ministers noted the outcomes of the Regional Energy Officials’ Meeting, acknowledging that they would be using them as a basis for formulating a communiqué.

3.3 Regional institutional framework (RIF) implication on Energy (Closed Session)

The CEOs of SPREP, SPC and SOPAC made a joint presentation to the meeting on the progress of the RIF initiative pertaining to the rationalisation of SOPAC functions into SPC and SPREP. Of the three components (below) for rationalisation that they had provisionally agreed; items (i) and (ii) were poised to be advanced to implementation stage, while the third was in progress. The CEOs were using the opportunity of these meetings of those that run the energy portfolio in the region to seek further guidance and direction as to the wisdom of component (ii), which specifically deals with the regional energy functions currently performed by SOPAC.

i. ICT – The ICT-Outreach component be coordinated and absorbed by SPC.

ii. Energy – The CROP lead organisation coordination role for the Pacific energy sector and petroleum advisory services be transferred to SPC. The components of renewable energy, energy efficiency and energy conservation4 be integrated into a new environment and resource management organisation.

iii. The rest of the SOPAC Programme of work – A re-branded regional environment and resource management organisation (potentially called the “Pacific Environment Resources Commission”) be established by integration of the ‘core’ functions and programmes of SPREP and SOPAC, while taking into account the recommendations of the SPREP Independent Corporate Review (ICR).

The Ministers noted the presentation and deferred further discussion and taking a decision on the matter for when they met in their specially scheduled Ministers’ Retreat later in the day.

Agenda Item 4 – THEMATIC SESSIONS

Presentations were made to the Pacific Energy Ministers by the CROP Energy Group members on various items/aspects that, although already captured in the Outcomes document from the Officials’ meeting, provided further information on key items to assist Ministers in their deliberations at their Retreat.

Presentations were heard from SOPAC on “Implementation of national energy policies” (Paper 09.4.1) and “Energy efficiency/conservation – demand side management” (Paper 09.4.4b); from PIFS on “Pacific petroleum project and national petroleum import policies” (Paper 09.4.2); from SPREP on “Renewable energy” (Paper 09.4.3); and from PPA on “Energy efficiency/conservation – supply side management” (09.4.4a). Recommendations from these papers were revisited, amended and noted under Agenda Item 6 – Adoption of Recommendations/Communiqué 2009.

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4 Noting the role of other CROP Organisations who have mandated responsibilities within the Pacific energy sector
The meeting was adjourned without any discussion under this item because of lack of time. The Ministers proceeded to their Retreat at the Royal Tonga Hotel. The rest of the participants attended the Session on Ocean Technologies at the main PEMM venue. A summary of the Session on Ocean Technologies is in Annex E.

Agenda Item 5 – OUTCOMES OF THE ENERGY MINISTERS’ RETREAT
Chair read the outcomes of the Ministers’ Retreat to the meeting in open session, then reconvened in closed session to allow the Ministers to further discuss and refine the text that would essentially form the final Communiqué for PEMM2009.

Agenda Item 6 – ADOPTION OF RECOMMENDATIONS/COMMUNIQUÉ 2009
The Ministers noted the following recommendations from the thematic papers heard under Agenda Item 4:

Implementation of National Energy Policies – Paper 09.4.1
• raise the profile of energy, as an imperative to national development, in national cabinet/parliamentary sessions; and
• call on regional and international agencies to have a coordinated/collaborative approach to support the implementation of national energy action plans.

Pacific Petroleum Project and National Petroleum Import Policies – Paper 9.4.2
• the progress made to date in supporting the implementation of the Pacific Plan’s Bulk Procurement of Petroleum Initiative; and
• the approach being utilised by the Forum Secretariat in taking the Pacific Plan’s Bulk Procurement of Petroleum Initiative forward.

Renewable Energy – Paper 09.4.3
• the importance of the region’s participation, including on a voluntary basis, in reducing GHG emission to the negotiations on climate change;
• the importance of making a commitment towards pursuing a renewable energy future that is based on national renewable energy targets, including on a voluntary basis, that are achievable and practical; and
• that while committing to a renewable energy future, energy efficiency or a mixture of renewable energy and fossil fuel, or fossil fuel may continue to be the better option for specific applications and at specific sites.

Energy Efficiency (Supply Side Management) – Paper 09.4.4a
• that because of the delays in achieving funding for the [energy efficiency study of power utilities] project, it is recommended that the approach to completing the objective in a shorter time frame be altered using consultants to work with the PPA and the power utilities. This will achieve a more appropriate time frame and permit an earlier commencement of the next phase of replacing inefficient equipment; and establishing key training programmes to enhance the operating and maintenance practices in the power plants. This approach will conform to the Communiqué from the 2007 Pacific Energy Ministers’ Meeting.
• that donors be sought for the additional [resources] needed to accelerate the quantification of power system energy losses.
Energy Efficiency (Demand Side Management) – Paper 09.4.4b

- to support the development of national policies/legislation to promote demand side management.
- call on CROP agencies and development partners to develop a Pacific land transport sector energy efficiency and conservation programme.

Agenda Item 7 – VENUE & DATE OF NEXT PEMM

The Minister from the Federated States of Micronesia moved (seconded by the Republic of Palau) that the Republic of the Marshall Islands be the host of the next REM/PEMM in 2011. The acceptance by the Marshall Islands was appreciated by acclamation.

The Minister from the Solomon Islands’ acceptance as host for the meeting after the 2011 Marshall Islands event was also noted for the record.

Agenda Item 8 – PEMM2009 SUMMARY RECORD

The Ministers agreed to review and approve the summary record of the PEMM2009 out of session.

Agenda Item 9 – CLOSING STATEMENT

The Pacific Energy Ministers held a signing of the PEMM Communiqué 2009 prior to the closing of the PEMM 2009.

Honourable Tuita, Chair of the PEMM 2009 thanked the Ministers and Officials for their cooperation and patience that contributed to the completion of the business of the meetings on schedule. He acknowledged the pressure at certain points, but that the conclusion was eminently satisfactory. He thanked the donor partners for their presence at the meeting, and the CROP agencies for the support in preparing the meeting papers. He made special mention of the tireless efforts of the Secretariat, and concluded with expressions of appreciation to the governments of the Republic of the Marshall Islands and Solomon Islands for their commitments to host the next meetings of the Pacific Energy Ministers and Officials.

The Minister from the Federated States of Micronesia rose on behalf of all delegates to thank the Chair and the Government and people of Tonga for their hospitality. He expressed gratitude for the generosity of the donor partners but noted that some helped themselves first in their own areas of interest. Being a believer in regional cooperation, he counselled members against being too proud to ask for assistance from one’s neighbours when it was needed, but also encouraged them to make the effort to help and strengthen themselves first.

Chair closed the meeting at around 1:00 pm.
A Regional Energy Officials’ Meeting (REM) was held at the Fa'onelua Convention Centre in Nuku'alofa, Kingdom of Tonga, during 20-22 April 2009. The following sixteen (16) countries were represented: Australia, Cook Islands, Federated States of Micronesia, Fiji Islands, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

The following Council of Regional Organisations of the Pacific (CROP) members were also in attendance: Pacific Islands Forum Secretariat (PIFS), Pacific Power Association (PPA), Secretariat of the Pacific Community (SPC), Secretariat of the Pacific Regional Environment Programme (SPREP), and the University of the South Pacific (USP) – with the Secretariat of the Pacific Islands Applied Geoscience Commission (SOPAC) organising the meeting.


Agenda Item 1 – OPENING SESSION

1.1 Welcome (Prayer)
Rev. Tu’iniua Finau of the Anglican Church offered an Opening Prayer, after reading a passage from the Bible and delivering a short message based on it.

1.2 Opening Statement
The Director of the SOPAC Secretariat, Ms Cristelle Pratt, welcomed delegates and delivered opening remarks (appended in full in Annex C1) in which she alluded to the theme of the meeting – Strengthening the Fragile Pacific Islands Energy Sector through addressing Energy, Economy and Environment in a period of rapid change. She noted the difference in the prevailing global conditions between REM 2007 and REM 2009, where the former was convened against a backdrop of “bludgeoning increases in fuel prices”; and that the current meeting had a “backdrop of a world in economic crisis”.
### 1.3 Keynote Address

The keynote address was delivered by Honourable Tuita, Minister of Lands, Survey, Natural Resources and Environment; in which he highlighted the three major issues in the Pacific energy sector as: (i) stability in the energy market by recognising the continuing role of fossil fuel and the need for more diversification; (ii) the important role that the energy sector plays in our climate change ambitions; and (iii) the need to ensure energy security without becoming protectionist. Honourable Tuita underlined the “imperative to maintain the momentum generated in the past Regional Energy Meetings, to continue our efforts against market volatility through our petroleum bulk purchase initiative and to move toward an energy course of action that is both appropriate to the Pacific and consistent with our climate change ambitions.” The full text of the address can be found in Annex C.

### Agenda Item 2 – WORKING PROCEDURES

#### 2.1 Adoption of Working Procedures

The Working Procedures (in draft in Paper REM09.2.15) were adopted; moved by Nauru and seconded by Samoa.

#### 2.2 Appointment of Chair and Vice-Chair

Samoa moved (seconded by Fiji) that Tonga assume the Chair of REM09 according to procedure.

Given that there was no indication from any members (represented at the time of discussion) to host the next REM (in 2011), and in the interest of advancing the business of the meeting, Fiji moved (seconded by Tuvalu) that the Republic of the Marshall Islands act as Vice-Chair on a no-strings-attached basis. The meeting accepted the nomination.

#### 2.3 Introductions

Member country and all other delegations participating at the meeting introduced themselves, as prompted by the Chair.

#### 2.4 Appointment of Rapporteur(s)

Chair announced that Ms Lala Bukarau was overall rapporteur for the meeting to coordinate the preparation of the draft summary record for consideration by the Drafting Committee.

#### 2.5 Appointment of Drafting Committee

An open-ended Drafting Committee was established under the Vice-Chair (Republic of the Marshall Islands), consisting of Samoa, New Zealand, Cook Islands and Fiji to oversee the production of the draft summary record.

#### 2.6 Adoption of the Agenda

Cook Islands moved (seconded by Australia) to adopt the agenda, and it was (see Annex B).

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5 Meeting papers are included in the CD accompanying this document
Agenda Item 3 – REPORT ON PROGRESS WITH IMPLEMENTATION OF THE PEMM2007 COMMUNIQUÉ

3.1 Progress and Outcomes of PEMM2007 Communiqué

Activities carried out in the intervening period that contributed to addressing key issues raised in the Energy Ministers’ 2007 Communiqué was reported by the SOPAC Secretariat on behalf of the Energy Working Group (Paper REM09.3.1). The report on activities was structured around the PIEP and its Strategic Action Plan, and concentrated on the priority areas as raised by the Ministers in 2007. The reporting on the PEMM has displaced the reporting against the PIERSAP somewhat, given that it was a Leaders’ directive that re-convened the PEMM after a lapse of more than ten years to address certain critical issues. The Energy Working Group (EWG) has used the PEMM2007 Communiqué as the benchmark for reporting in the last two of years; an approach also adopted by the Pacific Plan Action Committee (PPAC).

In noting the progress made toward implementing actions under the PEMM2007 Communiqué, Energy Officials acknowledged the capacity and resource constraints of CROP and national agencies to effectively meet all the commitments identified by Ministers.

Energy Officials also noted that the implementation of some priority areas take longer than the period between REMs and therefore a number of activities within the 2007 PEMM Communiqué are works in progress and will continue to be implemented in parallel with any other priority areas identified during the REM 2009.

Energy Officials urged CROP to strengthen internal cooperation and to work together actively with national agencies to set priorities and secure necessary additional resources to address national needs.

Energy Officials recommended that future Communiqué key action areas should be targeted and achievable, with realistic timeframes, prioritisation, and quantified progress reporting by member countries and CROP agencies, to ensure effective support is provided.

3.2 Overview of PEMM2009 Agenda

The SOPAC Secretariat presented the agenda and programme (Paper REM09.3.2) planned for the Ministers in their meeting later in the week for the benefit and information of the Energy Officials that would all be briefing their Ministers upon their arrival.

Energy Officials noted the draft agenda and working arrangements for the Pacific Energy Ministers’ Meeting and the Pacific Energy Ministers’ Retreat and agreed to ensure that their respective Ministers would be adequately briefed.

Agenda Item 4 – PLENARY ON REGIONAL ENERGY COORDINATION

Independent Consultant, Peter Johnston, presented a synopsis of a paper titled “Coordination and Implementation Mechanisms for Regional Energy and Pacific ACP EDF10 Energy Initiatives: A Discussion Paper and Concept Proposal” – that was prepared for SOPAC, in consultation with the EC Pacific Delegation (Paper REM09.4.1). The report was prepared in the context of the decision in late 2007 of Forum Leaders to rationalise those energy services currently being carried out by SOPAC into SPC and SPREP; and the significant level of new funding available to ACP Pacific states for energy under the EC’s EDF10.

The Consultant observed that recent ministerial and leaders’ communiqués, regional energy plans and policies, the Pacific Plan and other initiatives provide reasonable and consistent basis for developing priorities for regional assistance that helps develop more rational and sustainable energy use within the region. The range of activities endorsed by the Leaders, however, is very broad; beyond present or expected CROP agency resources; and not clearly prioritised.
Operational priorities are needed to guide the work of the CROP agencies and better mechanisms are needed for effective cooperation.

The Consultant presented a set of recommendations to improve coordination, cooperation and energy service delivery in PICs for the consideration of the Energy Officials. These included institutional changes to genuinely elevate the CROP energy profile and reduce duplication; and [identification] of a lead agency that could appropriately take on the roles of overall responsibility for analysis of issues and opportunities, be the focal point for donor interaction and coordination (inclusive of collection, analysis and dissemination of timely, up-to-date and consistent time-series data), facilitating and ensuring the fair allocation of funds for implementation. Two coordination mechanisms among CROP agencies that could be appropriated even while organisations had separate budgets, programmes, management and implementation were (i) joint (work) programming and (ii) physical co-location.

In subsequent discussion delegates focused on coordination among CROP agencies. The facilitator (Brian Dawson, AusAID) took time to seek the views of all the countries represented with respect to the recommendations made by the Consultant in papers REM09.4.1 and REM09.4.1a on a new mechanism to improve coordination among CROP agencies.

The facilitator highlighted to Energy Officials that this was an opportune time and that it was incumbent on officials participating at REM09 to advise their Ministers on this issue given that the timetable of the RIF process, currently underway, would take certain key decisions before the next REM. Countries agreed that the lack of coordination among CROP members was an issue which needed resolving.

All major concerns raised under this item have been incorporated into the list of fifteen Outcomes of the REM that can be found under Agenda Item 8.

Agenda Item 5 – CASE STUDIES AND TECHNICAL PAPERS

Recommendations from the individual case studies and technical papers, including those from the discussions under Item 4 on ‘Regional Energy Coordination’ have been synthesised and collated into a set of key outcomes from the Energy Officials to their Ministers. The set of key outcomes accounts for the issues raised by officials in plenary or during discussions following the hearing of the reports and presentations under this and subsequent items until the end of the REM2009.

For the purpose of this Summary Record, the set of key outcomes can be found under Agenda Item 8. Summaries of each presentation and paper in the case studies and technical documents are provided below. Papers provided in the meeting folders and presentations (handed in to the Secretariat) are also included in the CD accompanying this Proceedings volume (see back pocket).

5(a) Energy Economics, Energy Policies & Legislations

Electricity industry policy for Papua New Guinea (Paper REM09.5a.1)/Presenter – Vore Veve (Papua New Guinea)

Presentation summary: The case study on the Papua New Guinea (PNG) experience with drafting electricity industry policy presented an overview of what has been done to date. Prior to 2002, no policy framework for electricity existed in PNG, as a result a Task Force was established to address this problem, and a study undertaken to identify weaknesses and provide recommendations for improvement. An overview of current regulatory framework and industry structure were provided. The goal for improving electricity was sector presented, and strategic objectives identified. Policy measures outlined included technical, economic regulations and policies introduced to promote competition and private sector participation. The paper discussed implementation issues including institutionalization of electricity sector planning through the establishment of an electrification management committee and secretariat; and how economic and technical regulatory functions have been separated. Arrangements with provincial governments have been established to support policy implementation. Monitoring, evaluation and review measures utilised were highlighted.
Policy interventions to strengthen the Pacific Islands’ energy sector (Paper REM09.5a.2)/Presenter – Rupeni Mario (SOPAC)

**Presentation summary:** Why energy sector policy was needed including driving factors, responses and challenges was discussed. Various types of national legislation were mentioned e.g. rural electrification, renewable energy, and energy efficiency and conservation policies. The Tonga renewable energy bill and Palau energy conservation legislation in addition to other national policies in the region were discussed. Regional policies were presented – the Pacific Islands Energy Policy, the regional framework on climate change, and Pacific energy and gender strategic action plan, as well as regional forums for discussing energy issues. Challenges that included better data collection, improved cooperation and coordination, empowerment of legislators, and the need to follow through with implementation, monitoring and evaluation were mentioned. A series of national and regional recommendations were made in conclusion.

Taking control of oil in the Pacific and how economic tools can support better energy policy (Paper REM09.5a.3)/Presenter – Allison Woodruff (ADB)

**Presentation summary:** Pacific island countries are extraordinarily dependent on oil, but the paper confirms there are many options for reducing this dependence; including investments in renewable energy technologies, energy efficiency improvements, bulk procurement at a lower price and appropriate institutions and policies. Policy formulations around these available options however, must be underpinned by sound analysis of these options. Economic analysis of alternative energy measures is important for prioritizing and promoting efficient investments in the energy sector. The quality of any detailed analysis of energy options to support energy planning and policy making is determined by the comprehensiveness of energy data sets. Strategic analysis of national energy issues has been lacking due to weaknesses in national energy planning capacity and the absence of comprehensive energy data sets.

Economic analysis of the grid-connected 40 kW PV Project in Tuvalu (Paper REM09.5a.4)/Presenter – Mafalu Lotolua (Tuvalu)

**Paper summary:** The paper is a snapshot of the benefits and lessons learned from the installation of a 40-kW grid-connected solar PV system in Funafuti carried out under a programme of assistance to the Tuvalu Electricity Corporation from the e8-Group (an association of major power utilities from Canada, France, Germany, Italy, Japan, Russia and the United States). The Project cost US$412,000 with an estimated yearly output of 56 MWh, equivalent to 5% of the peak demand in Funafuti. It was commissioned in February 2008 and monitoring and evaluation of its performance has revealed savings of 15,300 litres of diesel equivalent to AUD28,000 and avoided emissions of 532 tonnes of CO2. The project is offered as a model for demonstrating grid-connected solar PV systems in small islands states.

5(b) Petroleum

Progress report on petroleum bulk procurement initiative (Paper REM09.5b.1)/Presenter – Ed Vrlic (PIFS)

**Talk summary:** Report on the work in progress with respect to the initiative that is subject of the referenced paper. Implementation is hoped by 2010. A Memorandum of Understanding (MoU) was referred to, which provides the policy statement on bulk procurement for the region. Now the focus is on implementation. More appraisal will be provided to Forum Leaders. Risks including complacency from low petroleum prices and other commercial risks were discussed. The MoU was talked about more with respect on how to lay out a framework, and the need to work with commercial industries. Three countries have signed the MoU to date. The Forum Secretariat is currently recruiting an Import Management Adviser who will have carriage of this activity and provide contract management oversight of a project implementation unit which will take forward the development of a commercial model to be tendered some time in late 2009 or early 2010. In addition to this week’s Energy Ministers’ Meeting, these issues will be discussed at the Forum Leaders’ Meeting in August 2009.
need to ensure that services are both appropriate for PICs while remaining commercially viable was highlighted.

Samoa’s experience of one supplier contract (Paper REM09.5b.2)/Presenter – Silia Ualesi (Samoa)

Presentation summary: Samoa had undertaken some major reforms dating back to the late 1970’s and early 1980’s in the quest to ensure that petroleum products are accessible, available and affordable. Relevant legislation which govern the procurement and use of petroleum products including quality and its implications were discussed. The features of the untenable pre-contractual period in Samoa when the supply of petroleum products were left to the market forces was explained where there were a few suppliers who have their own petroleum facilities and terminals and were also involved in distribution with some of them owning petroleum service stations. Despite their efforts, the quality of the service was regarded as poor and the petroleum prices were known to be too high. Political will was brought to bear on the situation; and while cluttered at the beginning it became more transparent and simple. The benefits, challenges and strategies highlighted since the bold move made in the late 90s in rationalising the petroleum supply and distribution in Samoa has made this a model case study for other PICs. An OPEC loan provided the financing needed to acquire and upgrade the oil supply infrastructure in Samoa has been paid off via factoring loan repayments into the pricing structure of the product including a minimal terminal fee for maintenance. The structure of both the old price template developed by the oil companies during the pre-contractual period and the simplified price template imposed by the Samoan Government in the current Request for Proposals tendering process was shown. The capacity of Government to ensure that the pricing formula was adequate and verifiable was crucial. The five-yearly cycle of contractual arrangements (awarded to a single supplier and distributor) in the country showed how current supply arrangements have increased Government’s bargaining power through owning the petroleum terminal and facilities, the Request for Proposal tendering process included having control on the determination of the fuel prices; hence Samoa reported that acquiring petroleum data from oil companies is not an issue unlike most other Pacific island countries. The main lessons learned, challenges, strategies adopted to address these challenges including issues raised for a regional approach were highlighted. This included a request for assistance on how to deal with waste petroleum products.

5(c) Energy Efficiency & Conservation

Demand side energy efficiency in Nauru (Paper REM09.5c.1)/Presenter – Sylvie Dageago (Nauru)

Presentation summary: The project background on the REP5 programme in Nauru was explained. An overview of supply and demand scenario for energy in Nauru, as well as energy payment arrangements was provided. Government intention to raise domestic tariff rates was stated. Discussed efforts under the project to conduct energy audits, design new tariff systems and connect a solar PV system into the electrical grid. The example of an energy audit carried out by SOPAC of government buildings during a training workshop conducted in Nauru was highlighted. Achievements under the project so far were reported, particularly in the areas of raising awareness on energy efficiency and conservation measures. Discussed lessons learned, that include time required to bring about changes in energy consumption behaviour, and involvement of all stakeholders for ensuring programme success. A personal assessment of programme progress was given, which was claimed to be slow due to limited understanding of programme objectives, as well as upcoming activities including salary deductions for electricity use for targeted groups, increased number of energy audits carried out and educational activities.
Minimum energy performance standards and labelling in Fiji (Paper REM09.5c.2)/Presenter – Peceli Nakavulevu (Fiji)

**Presentation summary:** The background on the value of fuel imports in Fiji, and how these rose with world oil prices was provided. In a period of 6 years, the value of fuel imports rose significantly, while export earnings declined, putting significant pressure on the trade balance. The fuel mix in Fiji was discussed, which consists of both diesel and hydro-power. Initial introduction of hydro reduced dependence on diesel, however in recent years dependence on diesel has grown again highlighting the fact that the transport sector consumed almost half of all fuel that is imported into Fiji. Various national energy policies which exist in Fiji were discussed. The background for MEPSL initiatives including the initial 1996 study that was commissioned to examine this issues was provided, which demonstrated the value of introducing energy standards in Fiji. In addition the baseline studies including the cost benefit analysis of the program that was sponsored by the Australian Greenhouse Office. Two options with regards to the implementation of MEPSL are the Voluntary and the Mandatory approaches and that they complement each other. How consumer awareness raising activities were carried out to promote the purchase of energy efficient appliances was explained, but the costliness of the exercise was noted. In 2005, the Fiji Government had committed to introducing efficiency standards for appliances, which led to the commissioning of a cost-benefit analysis study, and in 2006, the Cabinet granted approval (in principle) establishing energy standards for freezers and refrigerators. Problems associated with the enforcement of MEPS, and the need to work with the Customs Department was highlighted. Challenges associated with training of retailers, the administrative costs associated with the programme, and the need for compliance checks were also highlighted.

Palau energy efficiency project on residential homes (Paper REM09.5c.3)/Presenter – Charles Uong (Palau)

**Paper summary**: The Government of Palau "Energy Efficiency Subsidy Program" is one of many initiatives to address energy production and consumption. It is a "New Home Applicant" loan programme that specifically targets the integration of Energy Efficiency into the construction aspect of the building plans. The programme is designed to offset part of the marginal cost of including energy efficiency measures in news homes. With the money saved on electricity bills, the homeowners can repay their load faster than had they built a standard, inefficient home.

5(d) Renewable Energy Technologies/Power Sector

Solar home systems – technical/management model in Kiribati (Paper REM09.5d.1)/Presenter – Terubentau Akura (Kiribati Solar Energy Company Ltd)

**Presentation summary:** The aim of the Kiribati solar programme was discussed, which is to provide affordable access to reliable energy to everyone (meaning ‘all households’). The need for systems to be well designed and maintained in order to be sustainable was highlighted, as well as the fact that battery controllers have been developed so as to be appropriate to the environmental conditions in the country. The need to address the actual energy needs of the population, providing more than just lighting was also mentioned. The presenter talked about the need for technological, financial and institutional feasibility of solar power. He discussed institutional set up issues, first the retail sales model was used which resulted in bankruptcy since people do not maintain PV systems, resulting in a loss of confidence for this technology; however, it was highlighted that the solar services provision model had been successful. The need for good administrative management of the solar power company was emphasised. The presenter recommended the use of the RESCO approach, where systems are owned by an institution rather than the energy service beneficiary, as well as the use of open-source ERP software to assist with planning. The meeting was informed that software was being developed by Kiribati, and would be available for free to other PICs for download on their website.
UNELCO – energy of the future (Paper REM09.5d.2)/Presenter – John Chaniel (UNELCO)

**Presentation summary:** The presenter provided background on the utility company (UNELCO), and the nature of the service contract with the Vanuatu Government. He discussed how UNELCO and the Government of Vanuatu developed a strategy to address future energy needs, and came up with a 33% renewable energy target by 2013. Aspects of the wind farm on Efate were discussed, like how wind resource parameters at the proposed site were measured, the technical specifications of the wind systems, size of the initial investment, and carbon savings. The experience of UNELCO with coconut oil was explained, as a means of reducing dependence on imported fuel and providing a source for rural income. The presenter raised the issue of maximizing the extraction of the calorific value from coconut oil, and the need for the industrialization of the coconut oil production process. He talked about challenges in ensuring the quality and reliability of the supply of coconut oil. The price arrangement with suppliers was also elaborated. That the UNELCO is now able to use a 25% coconut/diesel blend was mentioned, and it is hoped that this ratio will be increased in the next few years. Jatropha is also being considered as a source of biofuel. Future directions, including more wind farms and increased coconut oil consumption, was highlighted. Figures which compared coconut oil to diesel in terms of how much money stays within the country was explained. The presenter highly recommended the sharing of experiences between countries.

Renewable energy developments in Fiji – Fiji Electricity Authority (Paper REM09.5d.3)/Presenter – Hasmukh Patel (FEA)

**Presentation Summary:** The Fiji Electricity Authority (FEA) has been involved in the development of Renewable Energy Schemes since 1979. The first hydro power project, the Monasavu Hydroelectric Scheme with a capacity of 80 MW, was established in the period 1979-1982 and was commissioned in 1983. Had it not been for this project, the price of electricity in Fiji would have been nowhere in the vicinity of FJD 0.23 per unit as it is today. The FEA developed a new Vision and Mission in 2004. The Mission was to be 100% renewable by the year 2010. This Mission has been revised since to take into account the prevailing conditions and the Mission today is to be at least 90% Renewable by the year 2012. Other hydro projects that were developed and commissioned after Monasavu by Sustainable Energy Limited (SEL), a Joint Venture Company between FEA and Pacific Hydro Ltd of Australia were Wainikasou in 2004 (6.4 MW) and Nagado in 2006 (2.8 MW). Butoni Wind Farm (10 MW, 11.3 GWh) was developed and commissioned in August 2007. The first year of operation of this Wind farm was affected adversely by Cyclone Gene in 2008 and therefore FEA will be able to ascertain the success of this project towards the end of this year. The FEA has been trying to attract Independent Power Producers (IPPs) for the last decade to invest in Renewable Energy projects and sell to FEA via a Power Purchase Agreement. Presently the IPPs supplying electricity to FEA are the Fiji Sugar Corporation (FSC) during their crushing season (some six months of the year) using bagasse and Tropik Woods Ltd through biomass generation. Many IPPs have shown interest but are unable to move ahead with their projects because the price offered by FEA (some FJD 0.13-0.14 per unit) does not guarantee them the required rate of return on their investments. The FEA is not able to offer them any better price due to their selling price to customers throughout Fiji being controlled by the Commerce Commission and the Government of Fiji which today averages around some FJD 0.23 per unit, which is one of the cheapest in the region. Another PPA has been recently signed with another company for biomass generation of electricity (some 15 MW) which FEA sincerely hopes to become a reality in the next 2-3 years. The FSC intends to improve their generation capacity in the next couple of years at a couple of their sugar mills and sell the surplus to FEA. An array of potential future renewal energy sources that include hydro, wind, geothermal and biomass were enumerated. Lessons learnt in the implementation of these renewable energy projects were outlined and briefly discussed. Some of them included proper storage of data and information, the importance of sorting out the land acquirement in totality prior to commencement of projects, the involvement of O&M personnel in design of project and equipment and the proper understanding of all contractual arrangement.
5(e) Energy, Climate Change and Environment
Outcome of the Pacific Climate Change Round Table (PCCR) process and its implications in the energy sector (Paper REM09.5e.1)/Presenter – Solomone Fifita (SPREP)

Presentation summary: The PCCR was held during 14-17 October 2008 in Samoa, funded by the Government of Switzerland and organised by CROP, with SPREP in the lead role. 133 participants attended from governments, regional organisations, academia, civil society and the media primarily to share information about the wide range of climate change-related activities being undertaken and the funding support available to carry them out. The PCCR Mitigation Working Group apparently noted the overemphasis on renewable energy over efficiency; and the concentration on software assistance rather than actual (hardware) installations. An additional challenge was the complexity of financing arrangements for climate change activities. The Mitigation Working Group identified Ocean Energy as a future renewable energy opportunity for the PICs and called for closer engagement of energy officials in climate change-related discussions and processes.

Pacific Regional Bioenergy Workshop 2008: Lessons learned on the implementation of biofuel projects in the Pacific (Paper REM09.5e.2)/Presenter – Tim Martyn (SPC)

Presentation summary: The report reflected on some lessons learned from the biofuels workshop held in Nadi in 2008 as a joint undertaking by CTA, SPC and SOPAC. The workshop was convened to confirm the region’s priorities in the area of developing biofuels in the Pacific; to share experiences of the implementation of biofuels projects in the region; and to develop some guidelines for the design of future projects, as well as for national policy. Many PICs had already identified biofuels (in various higher level forums) as a priority area for their energy security as well as a contributor to rural livelihoods. The consultations contributed to the development of guidelines on the raft of issues that needed addressing to successfully develop biofuels projects in the future. The delegates recommended that any national strategy need take a multi-sector approach, given the range of stakeholders that would need to be involved to develop such a strategy successfully.

5(f) Other Energy Issues

Background on the Foundation of Development Cooperation (Australia) was provided and particularly on their energy partnership with the Asian Development Bank (ADB) and other organizations and stakeholders. The issue of data gaps in the region was highlighted. The stakeholder consultation process was discussed, the point of which was to avoid the one-size-fits-all approach and in order to take into consideration local circumstances, particularly for off-grid electrification and village-level energy issues. That the FDC and ADB partnership
acts an incubator for initial projects was discussed, but eventually these should be stand alone. The role of the private sector in promoting access to energy was mentioned. The need for less focus on technologies and more focus on implementation and financing models such as micro-finance and other market-oriented approaches was highlighted. Key activities of the partnership showcased successful models and facilitating networking between stakeholders. The organizational structure of the Partnership with a lead steering committee and working groups was explained. The emphasis on private sector and financing institutions was highlighted.

Energy poverty in the PICs – challenges and the way forward/Presenter – Thomas Jensen (UNDP)

The importance of energy data for analysing key development issues was mentioned, particularly at the household level. The presenter also talked about the availability of HIES and census data, and household energy surveys in Samoa, Republic of Marshall Islands and Fiji Islands, which were supported by UNDP. The key findings from household energy surveys in southeast Asia, particularly the fact that household access to energy was very rarely linked to economic activity was shown. The need to integrate electricity with other services (and projects) to promote increased opportunity for income-generating was promoted. The summary publication ‘Energy and Poverty in Pacific Island Countries’ was mentioned.

A central databank on energy resources, demand and supply for the PICTs/Presenter – Ajal Kumar (USP)

The need for a central databank that contains all basic data on energy supply and demand for PICs was highlighted. That at least three years of consecutive energy data is needed, particularly to account for seasonal variation, was stressed. It was proposed that the project begin with renewable energy data. Data needs for assessing wind power, hydro-power and biomass potential was discussed. The presentation also highlighted the ideal characteristics of the proposed energy database.

Rural electrification through micro credit scheme – case study: Solomon Islands cash-for-crop sales for lighting/Presenter – David Iro (Solomon Islands)

Background was provided on solar projects in the Solomon Islands, including experience working with the private sector and with communities. Challenges associated with unreliable power in Solomon Islands were highlighted and the role of solar power in addressing this. Capacity building activities, including the SOPAC-REEEP current case study was discussed, and also activities to promote women in micro-enterprises. Solar electrification through micro-credit facilities was explained. The importance of local ownership was underscored. The features of the SOPAC-REEEP project was highlighted, including payment terms, description of solar kits along with issues and challenges.

SIDS DOCK LIMITED – A facilitating mechanism (An energy-based strategy for SIDS to limit temperature rise caused by climate change …)/Presenter – Al Binger (CCCCC)

The concept paper examined the economics of reducing petroleum dependency through energy efficiency and renewable energy by 50% in the Caribbean. The role of sugarcane in energy production for both power and transport fuels was discussed. An economic analysis comparison of producing sugarcane for sugar and for energy (power and ethanol), with the latter resulting in a significantly greater level of economic benefits was explained. The large potential for ‘elephant grass’ to produce biodiesel with 20,000 acres estimated to be able to produce 50 million barrels of oil equivalent was theorised. The OTEC technology and its potential for energy production, and its particular suitability in certain areas of the tropics where required temperature difference was present between surface and deeper water was detailed. An economic analysis for the theoretical case study on energy efficiency was presented.
Agenda Item 6a – DEVELOPMENT PARTNERS UPDATES

Energy Officials heard presentations from the following development partners: Asian Development Bank (ADB); AusAID, (the Government of) Austria, Technical Centre for Agricultural and Rural Cooperation (CTA), European Union, European Investment Bank, NZAID, REEEP, UNDP, UNIDO, World Bank and IUCN. All presentations provided to the Secretariat are available on the CD provided with the record of the meeting.

Agenda Item 6b – DISCUSSION ON IMPROVEMENT OF DONOR AGENCIES COORDINATION

The meeting received the following suggestions to start off discussion on this item: (1) that a formal link be established between the donor group and the CROP EWG; (2) donor partners might consider holding their meetings in the region in conjunction with key regional meetings such as this (when practical); and (3) that the focal point of the CROP working group be included in the circulation of the minutes of the donor group meetings.

A number of island members sought clarification on aspects of projects alluded to in development partners’ presentations, or arrangements being proposed to improve collaboration and transparency of partnerships. Other concerns raised by members include (lack of) equity in sharing of projects, accessibility requirements of ‘available’ funds can be frustrating to smaller energy offices with limited capacity and that a study into whether benefits of projects really accrued to the Pacific might be useful.

The meeting agreed that a formal link being established between the development partner group and the CROP Energy Working Group would be a good starting point and other mechanisms discussed would also add to improving of coordination.

Agenda Item 7 – PRIORITIES/LOOKING FORWARD

7.1 Strengthening of the Energy Sector in Pacific ACPs – EDF-10 Regional Energy Programme

The meeting heard a status report by SPREP Secretariat on behalf of the CROP Energy Working Group on a Euro 9 million regional submission for “Strengthening of the Energy Sector in Pacific ACP countries.” The concept note and identification phase of the submission was concluded in March 2009, and the development of the next phase would include consultations with Pacific ACP countries and other development partners. See also Paper 09.7.2.

Energy Officials noted the status of the EDF10 Regional Energy Programme submission and supported the development of the next phase of the project.

7.2 Regional Institutional Framework (RIF) Implication on Energy

In closed session, the CEOs of the secretariats of SOPAC, SPC and SPREP jointly presented to the REM a work in progress report with respect to the RIF initiative involving the rationalisation into the SPC and SPREP of the work programmes of SOPAC.

A consultancy that was commissioned by the three CEOs recommended the following rationalisation of the SOPAC programmes, which had been provisionally agreed by the three CEOs:

- ICT – The ICT-Outreach component be coordinated and absorbed by SPC.
- Energy – The CROP lead organisation coordination role for the pacific energy sector and petroleum advisory services be transferred to SPC. The components of renewable energy, energy efficiency and energy conservation be integrated into a new environment and resource management organisation.

6 Noting the role of other CROP Organisations who have mandated responsibilities within the Pacific energy sector
The rest of the SOPAC Programme of work – A re-branded regional environment and resource management organisation (potentially called the “Pacific Environment Resources Commission”) be established by integration of the ‘core’ functions and programmes of SPREP and SOPAC, while taking into account the recommendations of the SPREP Independent Corporate Review (ICR).

That the implications to energy of item (ii) on the list above would be far reaching was noted by the meeting. Further details of these implications and enumeration of the other immediate actions that are in progress to implement the three recommendations above are part of item 15 on the list of Outcomes of the REM2009 which is compiled under Agenda Item 8.

Agenda Item 8 – PREPARATION OF REM2009
RECOMMENDATIONS TO GO TO PEMM2009

The set of key outcomes of the REM2009 synthesised from the recommendations contained in papers, presentations and talks along with the substance of the concerns raised and solutions suggested during discussions under the REM2009 Agenda is as follows:

Regional Energy Officials Meeting 2009 Outcomes

Energy Officials draw particular attention to item 15 and its implications to the delivery of regional energy activities in the future.

- In noting the progress made toward implementing actions under the PEMM2007 Communiqué, energy officials acknowledged the capacity and resource constraints of CROP and national agencies to effectively meet all the commitments identified by Ministers.
- Energy Officials also noted that the implementation of some priority areas take longer than the period between REMs and therefore a number of activities within the 2007 PEMM Communiqué are work in progress and will continue to be implemented in parallel with any other priority areas identified during the REM 2009.
- Energy Officials recommended that future Communiqué key action areas should be targeted and achievable, with realistic timeframes, prioritisation, and quantified progress reporting by member countries and CROP agencies, to ensure effective support is provided.
- Energy Officials urged the CROP to improve internal coordination, cooperation and collaboration mechanisms, and for the Energy Working Group to establish formal links with the Donor Working Group and other development partners and, to work together actively with national agencies and governments to set priorities and secure necessary additional resources to address national needs.
- Energy Officials expressed the need to review and as appropriate strengthen national capacity in energy data and information gathering and collation, management, dissemination and, analysis on economics, social and environment to better inform national and regional energy planning and policy choices.
- Energy Officials emphasised the need for national energy policy and action plans, and regulatory frameworks to: incorporate priorities; to be flexible and create space for private sector participation; to include economic analysis of options and funding requirements and responsibilities; to safe guard the environment and livelihoods; and to encourage investment in maintaining ecosystem services that support energy development; in order to ensure that energy initiatives are progressed and national energy targets are realised.
- Energy Officials acknowledged the need to review the Pacific Islands Energy Policy and its associated action plan, as time and resources allow.
- Energy Officials endorsed the Pacific Energy and Gender Strategic Action Plan 2009-2014 and recommended that gender be mainstreamed into national and regional energy initiatives.
• Energy Officials acknowledged progress in the implementation of the regional bulk fuel procurement initiative and called upon CROP agencies to continue to support PICs to move the initiative to implementation inline with the Leaders decision. Energy Officials also noted with interest best practice case studies on rationalisation of petroleum supply and distribution, cost savings achieved, and indicated the need to address the disposal of waste oil.

• Energy Officials stressed the need for appropriate policies, incentives and programmes to improve energy efficiency and conservation, including focus on minimum energy performance standards and labelling.

• Energy Officials underlined the need to strengthen human capacity development initiatives to support national and regional energy programmes, and especially to improve the performance of power utilities to be on going and focus on the development of apprentice schemes.

• Energy Officials encouraged PICs to set voluntary renewable energy and energy efficiency targets consistent with their national development plans and priorities and, share experiences and expertise particularly, on emerging opportunities and lessons learned, including in relation to innovative financing models.

• Energy Officials acknowledged the Year of Climate Change – 2009, and encouraged national and regional agencies including the CROP EWG to strengthen interactions with climate change discussions, negotiations and processes such as the Pacific Climate Change Roundtable and its mitigation working group.

• Energy Officials encouraged support to the development of biofuels production and use where economically viable, and acknowledge the need to consider energy and agriculture impacts (particularly food security), as well as the assessment of impacts on the environment.

• Noted the presentation of the three CEOs (SPC, SOPAC and SPREP) on the implementation of the Regional Institutional Framework as it relates to the energy sector and welcomed the directions proposed in paragraphs 10, 14 and 16 of the paper REM09 7.2 (grey text below).

Role of lead agency for coordinating the regional energy sector (SPC)

Paragraph 10 of REM09 7.2

The key role of the lead coordination agency for the regional energy sector is that of providing leadership for, and improving the profile of energy as a key priority sector in the Pacific islands region. In this regard the lead coordination agency will have the following responsibilities:

• Establish a dedicated long-term senior position in the organisation with funding that is not dependent on project funding to effectively facilitate regional energy sector coordination to raise and maintain the profile of energy at all levels.

• Overall responsibility for analysis of trends in the energy sector, issues and challenges, and identity opportunities for strategic engagement by the region at national, regional and the international levels.

• Proactively undertake social, economic and policy research and analysis on the energy sector (petroleum, transportation, renewable energy, energy efficiency and energy conservation, energy infrastructure, power) and provide policy responses and strategic solutions to members and key stakeholders, to inform their own decision-making processes.

• Coordinate the development of a joint, regional energy sector work-plan with an appropriate M&E and prioritised framework that involves all stakeholders to effectively implement the regional energy policy and plan.

• Develop and sustain a comprehensive, coordinated and shared approach to data collection, analysis and dissemination in the energy sector.

• Develop and sustain a common energy data and information system.

• Focal point for development partner interaction and coordinate resource mobilisation and allocation for the delivery of regional energy services.

• Establish and facilitate mechanisms that will involve key energy stakeholders in strategic analysis of emerging challenges and opportunities, as well as the oversight, decision-making and / or management of issues in or affecting the energy sector.
Role of implementing organisations and partners

Paragraph 14 of paper REM09 7.2

In this regard:

- the new environment and resource management organisation (resulting from the integration of the SPREP and SOPAC programmes), as a key stakeholder within the regional energy sector and its programme of work, would implement actions related to renewable energy, energy efficiency and energy conservation. It will also contribute to research and policy work in these areas.

- PPA will continue its work in the power sector.

- USP will continue its work on the areas it is involved in on the energy sector.

- SPC will implement actions in the petroleum area when petroleum functions transfer from PIFS to SPC.

- Other key stakeholders involved in implementing energy solutions in the region will continue their roles and will actively participate in the improved coordination and implementation of priorities in the regional energy sector.

Taking the coordination mechanism further

Paragraph 15 of REM09 7.2

Cognisant of this issue the CEOs are exploring the option of possibly ‘co-locating’ the various components of their energy programmes in one location to enhance coordination, service delivery and a ‘one-team’ approach. Each agency that is co-located will retain its own organisational identity and integrity in the team.

Agenda Item 9 – VENUE AND DATE OF NEXT REM

Two offers were before the meeting for the hosting of the next REM in 2011:

(1) Republic of the Marshall Islands; and

(2) Solomon Islands.

A push by the northern Pacific members to take the REM up north was apparent and the Republic of Marshall Islands offered that if no confirmation was forthcoming from Majuro within the next 24 hours that they would defer to the Solomon Islands’ offer to host REM 2011, and prepare to host the one after.

Agenda Item 10 – REM2009 SUMMARY RECORD

The meeting accepted the Secretariat’s proposal to complete compilation of the draft summary record of REM2009 by the end of the week and finalise it out of session.

Agenda Item 11 – GENERAL DISCUSSION AND WRAP UP OF REM2009

Energy Officials expressed deep appreciation to the Chair for the excellent arrangements and facilities provided by the host country that made their short visit to the Kingdom of Tonga a memorable experience.

The Chair reciprocated by thanking the Officials for their cooperation and enthusiastic participation at the REM2009 and closed the meeting around 7:15 pm.
Annexes

A. List of Participants
B. Schedule of Meetings and Agenda
C. Speeches – Opening, Keynote, Remarks
D. Country Statements
E. Ocean Technologies Session
F. Acronyms

(On CD only)

Meetings’ documentation, summary records
- REM Papers and Presentations
- PEMM Papers and Presentations
- Proceedings volume (this document)
Annex A
List of Participants

Member Countries

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### Agenda

#### Monday, 20th April – Day 1, REM2009

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Sessions</th>
<th>Facilitator/Presenter</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, 20th April</td>
<td>8.00 – 9.00 am</td>
<td>Registration</td>
<td></td>
<td>Fa’onelua Convention Centre</td>
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<tr>
<td></td>
<td>9.00 – 9.45 am</td>
<td>Session 1 Opening Session</td>
<td>Facilitator: REM2007 Chair</td>
<td>Rev. Tu’inuia Finau, SOPAC Director, Tonga’s Minister for Lands &amp; Survey, Environment</td>
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<td></td>
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<td>1. Welcome (Prayer)</td>
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<td>2. Opening Statement</td>
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<td>3. Keynote Address</td>
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<td></td>
<td>10.15 – 10.30 am</td>
<td>Session 2 Working Procedures and Agenda</td>
<td>REM2007 Chair</td>
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<tr>
<td></td>
<td></td>
<td>1. Adoption of Working Procedures</td>
<td>REM2009 Chair</td>
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<td>2. Appointment of REM2009 Chair and Vice Chair</td>
<td>REM2009 Chair</td>
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<td></td>
<td>3. Introductions</td>
<td>REM2009 Chair</td>
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<td>4. Appointment of Rapporteurs</td>
<td>REM2009 Chair</td>
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<td>5. Appointment of Drafting Committee</td>
<td>REM2009 Chair</td>
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<td>6. Adoption of Agenda</td>
<td>SOPAC</td>
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<td>7. Housekeeping</td>
<td>SOPAC</td>
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<td></td>
<td>10.30 – 12.00 pm</td>
<td>Session 3 Report on Progress with Implementation of the PEMM2007 Communiqué</td>
<td>REM2009 Chair</td>
<td>Discussion on PEMM2009 Agenda</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Progress &amp; Outcomes of PEMM2007 Communiqué</td>
<td>SOPAC</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>2. Overview of PEMM2009 Agenda</td>
<td>SOPAC</td>
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<td><strong>LUNCH</strong></td>
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</tbody>
</table>
### Monday, 20th April - REM2009

<table>
<thead>
<tr>
<th>TIME</th>
<th>SESSION</th>
<th>FACILITATOR/PRESENTER</th>
<th>COMMENTARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 – 3.00 pm</td>
<td>Session 4 Plenary on Regional Energy Coordination</td>
<td>Facilitator: Brian Dawson (AusAID)</td>
<td>CROP Agencies and IUCN and EU/IT POWER are to prepare discussion notes that will contribute to the basis for the plenary session. The only powerpoint presentation in this session will be undertaken by Peter Johnston.</td>
</tr>
<tr>
<td>3:30 – 4:30 pm</td>
<td>Derivation of recommendations from Sessions 3 and 4 to go to the PEMM2009</td>
<td>Facilitator: Solomone Fifita (SPREP)</td>
<td>These 15 minutes will be an open discussion on any other outstanding issues and housekeeping.</td>
</tr>
<tr>
<td>4:30 – 4:45 pm</td>
<td>General Discussions Closing of Day 1</td>
<td>REM2009 Chair</td>
<td></td>
</tr>
<tr>
<td>6:00 – 800pm</td>
<td>WELCOME RECEPTION</td>
<td>Hosted by the Director SOPAC</td>
<td></td>
</tr>
</tbody>
</table>

### Tuesday, 21st April – Day 2, REM2009

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>SESSIONS</th>
<th>FACILITATOR/PRESENTER</th>
<th>COMMENTARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday, 21st April</td>
<td>8:30 – 10:15 am</td>
<td>Opening Prayer Recap of Day 1 Session 5 Case Studies &amp; Technical Papers 5 (a) Energy Economics, Energy Policies &amp; Legislations</td>
<td>REM2009 Chair REM209h Chair Facilitator: Peceli Nakavulevu (Fiji)</td>
<td>25 minutes per session – 10 minutes per presentation/15 minutes overall discussion after all the presentations.</td>
</tr>
<tr>
<td></td>
<td>10:45 – 11:35 am</td>
<td>5 (c) Energy Efficiency &amp; Conservation</td>
<td>Facilitator: Mata Noorooa (Cook Islands) Peceli Nakavulevu (Fiji) Sylvie Dageago (Nauru) Charles Uong (Palau)</td>
<td>25 minutes per session – 10 minutes per presentation/15 minutes overall discussion after all the presentations.</td>
</tr>
<tr>
<td></td>
<td>11:35 – 12:50 pm</td>
<td>5 (b) Petroleum</td>
<td>Facilitator: Charles Uong (Palau) Ed Vrkc (PIFS) Silia Ualesi (Samoa)</td>
<td>25 minutes per session – 10 minutes per presentation/15 minutes overall discussion after all the presentations.</td>
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### MORNING TEA

**DATE** | **TIME** | **SESSIONS** | **FACILITATOR/PRESENTER** | **COMMENTARY** |
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<tbody>
<tr>
<td>Tuesday, 21st April</td>
<td>10:45 – 11:35 am</td>
<td>5 (c) Energy Efficiency &amp; Conservation</td>
<td>Facilitator: Mata Noorooa (Cook Islands) Peceli Nakavulevu (Fiji) Sylvie Dageago (Nauru) Charles Uong (Palau)</td>
<td>25 minutes per session – 10 minutes per presentation/15 minutes overall discussion after all the presentations.</td>
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<tr>
<td></td>
<td>11:35 – 12:50 pm</td>
<td>5 (b) Petroleum</td>
<td>Facilitator: Charles Uong (Palau) Ed Vrkc (PIFS) Silia Ualesi (Samoa)</td>
<td>25 minutes per session – 10 minutes per presentation/15 minutes overall discussion after all the presentations.</td>
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</table>
**Tuesday, 21st April
DAY 2 – REM2009**

<table>
<thead>
<tr>
<th>Time</th>
<th>Sessions</th>
<th>Facilitator</th>
<th>Commentary</th>
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</thead>
<tbody>
<tr>
<td>1.50 – 3.30 pm</td>
<td>5 (d) Renewable Energy Technologies/Power Sector</td>
<td>Ajal Kumar (USP)</td>
<td>25 minutes per session – 10 minutes per presentation/15 minutes overall discussion after all the presentations.</td>
</tr>
<tr>
<td></td>
<td>2. UNELCO – Energy of the Future</td>
<td>John Chaniel (UNELCO)</td>
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<tr>
<td></td>
<td>3. Renewable Energy Developments in Fiji – Fiji Electricity Authority</td>
<td>Hasmukh Patel (FEA)</td>
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<td></td>
<td>4. Human Capacity Building in Power Utilities</td>
<td>Tony Neil (PPA)</td>
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<tr>
<td>3.30 – 4.20 pm</td>
<td>5 (e) Energy, Climate Change &amp; Environment</td>
<td>Paulson Panapa (Tuvalu)</td>
<td>25 minutes per session – 10 minutes per presentation/15 minutes overall discussion after all the presentations.</td>
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<tr>
<td></td>
<td>1. Outcome of the Pacific CC roundtable process and its implications on the energy sector</td>
<td>Solomone Filita (SPREP)</td>
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<td></td>
<td>2. Pacific Regional Bioenergy Workshop 2008: Lessons learned on the implementation of biofuel projects in the Pacific</td>
<td>Tim Martyn (SPC)</td>
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**AFTERNOON TEA**

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<thead>
<tr>
<th>Time</th>
<th>Sessions</th>
<th>Facilitator</th>
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<tbody>
<tr>
<td>4.40 – 5.20 pm</td>
<td>Derivation of recommendations from Session 5(a)-5(e) for PEMM2009</td>
<td>Tony Neil (PPA)</td>
</tr>
<tr>
<td>5.20 – 5.30 pm</td>
<td>General Discussions/Recommendations from Day 2 (PM) Closing of Day 2</td>
<td>REM2009 Chair</td>
</tr>
</tbody>
</table>

**Wednesday, 22nd April – Day 3, REM2009**

**DATE** | **TIME** | **SESSIONS** | **FACILITATOR/PRESENTER** | **COMMENTARY** |
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<tbody>
<tr>
<td>8.30 – 10:15 am</td>
<td>Opening Prayer</td>
<td>REM2009 Chair</td>
<td>25 minutes per session – 10 minutes per presentation/15 minutes overall discussion after all the presentations.</td>
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<tr>
<td></td>
<td>Recap of Day 2</td>
<td>REM2009 Chair</td>
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<td></td>
<td>Session 5 Case Studies &amp; Technical Papers continues</td>
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<td>5 (f) Other Energy Issues</td>
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<td></td>
<td>1. Access to Energy for the Poor – Asia-Pacific Regional Initiative “E4ALL”</td>
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<td></td>
<td>2. Energy and Poverty in the PICs-Challenges and the Way Forward</td>
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<td>3. A central databank on energy resources, demand and supply for the PICs</td>
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<td></td>
<td>4. Rural Electrification through Micro Credit Scheme – Case Study: Solomon Islands Cash-for-Crop Sales for Lighting</td>
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**MORNING TEA**

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<tr>
<th>Time</th>
<th>Sessions</th>
<th>Facilitator</th>
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<tbody>
<tr>
<td>10.45 –12.00 pm</td>
<td>Session 6 (a) Development Partners Updates</td>
<td>Peter Johnston</td>
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<tr>
<td></td>
<td>1. ADB – Anthony Maxwell</td>
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<td>2. AusAID – Paul Wright</td>
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<td>3. Government of Austria – Lukas Wolfgang Strohmayer</td>
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<td>4. European Commission – Lenaic Georgelin</td>
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<td>5. NZAID – Mark Ramsden</td>
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<td>6. IUCN – Anare Mataikivi</td>
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<td>7. REEEP – Eva Oberender</td>
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<td>8. UNDP – Thomas Lyng Jensen</td>
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<td>9. World Bank – Wendy Hughes</td>
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<td>10. CTA – Hansjoerg Neun</td>
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<td>11. UNIDO – Sebastian Hermann</td>
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<td>12. European Investment Bank – Nigel Hall</td>
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| 12.00 – 1.00 pm| Session 6 (b) Discussion on Improvement of Donor Agencies Coordination | Peter Johnston               |

**LUNCH**
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Facilitator</th>
<th>Presenter</th>
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<tbody>
<tr>
<td>2:00 – 3:00 pm</td>
<td>Session 7 Priorities/Looking Forward</td>
<td>Facilitator: REM2009 Chair</td>
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<tr>
<td></td>
<td>2. Regional Institutional Framework (RIF) implication on Energy (Closed Session)</td>
<td>Presenter: Joint CEOs (SOPAC/SPREP/SPC)</td>
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<tr>
<td>10 minute</td>
<td>presentation followed by discussions</td>
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<td></td>
<td>10 minute presentation followed by discussions (Closed Session)</td>
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<tr>
<td>3:30 – 4:00 pm</td>
<td>Session 8 Preparation of REM2009 Recommendations to go to PEMM2009</td>
<td>REM2009 Chair</td>
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<tr>
<td>4:00 – 4:15 pm</td>
<td>Session 9 Venue and Date of next REM</td>
<td>SOPAC</td>
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<tr>
<td>4:15 – 5:15 pm</td>
<td>Session 10 REM2009 Summary Record</td>
<td>REM2009 Chair</td>
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<tr>
<td>5:15 – 5:30 pm</td>
<td>General Discussion and Wrap Up of REM2009</td>
<td>REM2009 Chair</td>
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<tr>
<td>5:30 pm</td>
<td>MEETING CLOSED</td>
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<tr>
<td>6:30 – 8:30 pm</td>
<td>INFORMAL MEETING – ENERGY OFFICIALS AND ENERGY MINISTERS</td>
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<td></td>
<td>(Energy Officials to brief their respective Ministers – own arrangements)</td>
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</table>
# PACIFIC ENERGY MINISTERS’ MEETING (PEMM2009)

Fa’onelua Convention Centre, Nuku’alofa, Tonga  
23-24 April 2009

## STRENGTHENING THE FRAGILE PACIFIC ISLANDS ENERGY SECTOR  
Addressing energy, economy and environment in a period of rapid change

### AGENDA

**Thursday, 23rd April – Day 1, PEMM2009**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Sessions</th>
<th>Facilitator/Presenter</th>
<th>Commentary</th>
</tr>
</thead>
</table>
| 23rd April | 9.00 – 9:30 am | Session 1 Opening Session  
1. Prayer and Opening Formalities  
2. Opening Remarks  
3. Keynote Address | PEMM2007 Chair  
Rev. Ahio  
Tonga’s Deputy Prime Minister  
PIFS Secretary General |  |
| 23-24 April | 10.00 – 10.15 am | Session 2 Working Procedures and Agenda  
1. Adoption of Working Procedures  
2. Appointment of PEMM2009 Chair and Vice-Chair  
3. Appointment of Rapporteurs  
4. Appointment of Drafting Committee  
5. Adoption of Agenda  
6. Housekeeping | PEMM2007 Chair  
PEMM2009 Chair  
PEMM2009 Chair  
PEMM2009 Chair  
SOPAC |  |
| 23-24 April | 10.15 – 11:30 am | Session 3 Reporting  
1. Report on progress with implementation of PEMM2007 Communiqué  
2. Presentation of REM2009 recommendations Discussions  
3. Regional Institutional Framework (RIF) implication on Energy | PEMM2009 Chair  
SOPAC  
REM2009 Chair  
Joint CEOs (SOPAC/SPREP/SPC) | 15 minute per presentations followed by discussions,  
10 minute presentation |
| 23-24 April | 11:30 – 1:00 pm | Session 4 Thematic Sessions  
1. Implementation of national energy policies  
2. Pacific Petroleum Project and national petroleum import policies  
3. Renewable Energy  
4. Energy Efficiency/Conservation Supply Side Management Demand Side Management  
5. Discussions | PEMM2009 Chair  
PIFS  
SPREP  
PPA  
SOPAC | 5 minute presentation followed by 1 hour discussion |

**Lunch**
AGENDA

THURSDAY, 23RD APRIL – DAY 1, PEMM2009

<table>
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<tr>
<th>DATE</th>
<th>TIME</th>
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<th>FACILITATOR/PRESENTER</th>
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<tbody>
<tr>
<td>Thursday, 23rd April</td>
<td>2:30 – 2:45pm</td>
<td>Session 1 Opening Session</td>
<td>PEMM2009 Chair</td>
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<td></td>
<td>2:45 – 3:30 pm</td>
<td>1. Prayer and Opening Remarks</td>
<td>PEMM2009 Chair</td>
<td>CROP Agencies &amp; REM2009 Chair should be available for advisory role on energy issues.</td>
</tr>
<tr>
<td>DAY 1 – PEMM2009</td>
<td></td>
<td>2. Session 2 Plenary Session 1</td>
<td>PEMM2009 Chair</td>
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<td></td>
<td></td>
<td>1. Progress on Communiqué 2007</td>
<td>PEMM2009 Chair</td>
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<td>2. Recommendations from REM2009</td>
<td>PEMM2009 Chair</td>
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<td>AFTERNOON TEA</td>
<td>PEMM2009 Chair</td>
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<tr>
<td></td>
<td>4:00 – 5:00 pm</td>
<td>Session 2 Plenary Session 2</td>
<td>PEMM2009 Chair</td>
<td>CROP Agencies &amp; REM2009 Chair should be available for advisory role on energy issues.</td>
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<tr>
<td></td>
<td></td>
<td>1. Discussion on PEMM2009 Session 4: Thematic Session</td>
<td>PEMM2009 Chair</td>
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<td></td>
<td>5:00 – 5:45 pm</td>
<td>Derivation of Ministers Retreat Outcomes</td>
<td>PEMM2009 Chair</td>
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<td>5:45 – 6:00 pm</td>
<td>CLOSING REMARKS</td>
<td>PEMM2009 Chair</td>
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<td>7:00 – 9:00 pm</td>
<td>DRINKS/DINNER</td>
<td>PEMM2009 Chair</td>
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SESSION ON OCEAN TECHNOLOGIES

The venue is at the Fa' onelua Convention Center, Nuku’alofa, and will be convened in parallel with the Ministers Retreat. The primary objective of the session is to provide an overview and up date of ocean energy technologies which will provide energy officials and other stakeholders an insight of the technologies and associated issues. A plenary session will follow the presentations.

THURSDAY, 23RD APRIL

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<tr>
<th>TIME</th>
<th>SESSIONS</th>
<th>FACILITATOR/PRESENTER</th>
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<tbody>
<tr>
<td>13:00</td>
<td>Opening and Welcome</td>
<td>Fa' onelua Convention Centre</td>
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<tr>
<td>14:00</td>
<td>Opening and Welcome</td>
<td>Rupeni Mario (SOPAC)</td>
<td>Rupeni Mario (SOPAC) and Aijal Kumar (USP) will be co-facilitating this session.</td>
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<tr>
<td>14:15</td>
<td>Renewable Energy from the Oceans – An Overview of Status and Potential</td>
<td>Anthony Derrick, Managing Director, IT Power, UK</td>
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<tr>
<td>15:00</td>
<td>Ocean Technologies</td>
<td>Barbara Vlaeminck, Director, Societe de Recherche du Pacifique (SRP), New Caledonia</td>
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<td>15:30</td>
<td>COFFEE BREAK</td>
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<tr>
<td>16:00</td>
<td>Can Tidal Current Generation work in the Pacific?</td>
<td>Garry Venus &amp; Luke Gowing, New Zealand</td>
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<tr>
<td>16:30</td>
<td>Panel Discussion What should PICs be doing or not doing regarding Ocean Renewable Energy? Is it too early to develop a Road Map for Ocean Renewables in the Pacific?</td>
<td>Anthony, Barbara, Garry/Luke</td>
<td>An opportunity for the audience to put-forward questions to the presenters.</td>
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<tr>
<td>17:30</td>
<td>Closing</td>
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<td>18:00 - 20:00</td>
<td>Drinks and Food hosted by IT Power - UK</td>
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# AGENDA

**FRIDAY, 24TH APRIL – DAY 2, PEMM2009  
(FA’ONELUA CONVENTION CENTRE)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session/Activity</th>
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<tbody>
<tr>
<td>9:00 – 9:05 am</td>
<td>Opening Prayer</td>
</tr>
<tr>
<td>9:05 – 9:30 am</td>
<td>Session 5 Outcomes of the Energy Ministers Retreat</td>
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<tr>
<td>9:30 – 11:00 am</td>
<td>CLOSED SESSION – Ministers &amp; Designated Representatives (ONLY)</td>
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<tr>
<td>12:00 – 12:30 pm</td>
<td>Session 6 Presentation, Adoption of Recommendations/Communique 2009</td>
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<tr>
<td>12:30 – 12:45 pm</td>
<td>Session 7 Venue &amp; Date of Next PEMM</td>
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<tr>
<td>12:45 – 12:50 pm</td>
<td>Session 8 Adoption of the Summary Record for the PEMM2009</td>
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<tr>
<td>12:50 – 1:00 pm</td>
<td>Session 9 Closing Statements</td>
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<td>1:00 pm</td>
<td>Closing</td>
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<tr>
<td>2:00 pm</td>
<td>Media Briefing</td>
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<td>2:00 – 3:00 pm</td>
<td>REEEP Showcase – Solomon Islands Micro Financing Model</td>
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<tr>
<td>3:00 – 4:00 pm</td>
<td>ADB – Presentation on E4ALL</td>
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**STRENGTHENING THE FRAGILE PACIFIC ISLANDS ENERGY SECTOR**

Addressing energy, economy and environment in a period of rapid change
Opening Remarks by Honorable Dr Viliami T. Tangi – Deputy Prime Minister of Tonga at the Official Opening Ceremony of the Pacific Energy Ministers’ Meeting


This morning I am deeply honoured and grateful for the opportunity to deliver this opening remark on behalf of the Prime Minister of Tonga. And on behalf of the Government I would like to extend to each and everyone of you our heartfelt and warm welcome to the friendly islands and the kingdom of Tonga. I am also very happy indeed to welcome all of you to the Second Pacific Island Energy Ministers Meeting.

As you know the first meeting of the Pacific Energy Ministers was in Rarotonga in the Cook Islands in 2007; and you in that meeting discussed a broad range of energy issues, identifying challenges and opportunities under the overarching theme of Energy Security for Sustainable Development. This in part has paved the way to this Second Pacific Energy Ministers meeting here in Tonga with the theme of “Strengthening the Fragile Pacific Islands Energy Sector – and addressing energy, economy and environment in a period of rapid change”. We consider this meeting in Tonga as a positive step that will contribute to implementing the Forum Leaders decision, where they endorsed in the year 2007 the Pacific Energy Ministers’ Communiqué and recognized the need for the immediate implementation of very concrete and time-bound actions.

Further, the Leaders of the Pacific Island Countries recognize Energy as one of the key requirements for sustainable development, and in terms of economic growth, social development, and environment sustainability. This has been reflected in the Pacific Plan as well as, the Millennium Development Goal level, which articulates the need for equitable access to reliable and affordable energy as a fundamental requirement to achieving core national development goals such as economic growth, poverty alleviation and improved health and education services. This was also part of a thematic cluster for the Commission on Sustainable Development Sessions (CSD14 and 15) which included “Energy for Sustainable Development, Industrial Development, Air Pollution / Atmosphere, and Climate Change”.

This clearly demonstrates that countries need to address energy and environment in an integrated and balanced manner. In strengthening these development linkages, more emphasis has been given to the economic aspects of energy which offers another dimension and contributes to strengthening the planning and development processes.

It is therefore important that we must effectively integrate energy into national planning processes, along with embracing the principle of equitable access to reliable and affordable energy. This is a fundamental requirement for achieving national development goals. I am aware that within our region, the Regional Pacific Islands Energy Policy developed jointly by Energy Officials and relevant CROP Agencies in 2004, has provided a basis for not only guiding the energy sector at the regional level, but has provided a model that has been used extensively at the national level to develop national energy policies, legislations and strategic action plans both for energy and environment.

Within this context we endorse and acknowledge the importance of implementing appropriate policies and programmes that promote the adoption of an optimal energy mix, energy efficiency in supply and consumption and the integration of appropriate sustainable renewable energy...
technologies. Perhaps the most important endorsement must be to continue to recognise and acknowledge the need for a continued high-level support in respect to the energy agenda if we are to aspire to the guiding principles of the Pacific Plan.

In order to deliver against our energy priorities we will undoubtedly need to address the short fall in our own levels of national commitment, ensure that regional coordination mechanisms are aligned to provide optimal support to the energy sector, and to look to our development and donor partners, to augment the necessary resources, support and appropriate technology to achieve all these.

As we are all aware of, over the past years the crude oil prices continued to rise up to more than US$147 a barrel (and that was up to July of last year), and which has been reflected in increased product prices over the latter part of 2008 and after reaching earlier levels of $US30 a barrel, it has now slowly climbed back up to just over $US50 a barrel.

The impact of elevated oil prices on our economies is critically significant. For example, the fuel imports are now triple the value of merchandise exports in Kiribati, Samoa and the Federated States of Micronesia. In the case of Fiji, the second largest economy in the Pacific region, recently the combined export earnings from three of the country’s major industries, gold, sugar and textiles, only accounted for two thirds of the country’s total fuel import bill.

These economic indicators clearly demonstrate the serious impact that increases in the cost of fossil fuels have had and will continue to have on Pacific island countries.

In acknowledging the impact of sustained high oil prices in the Pacific, efforts towards the implementation of regional cooperation for bulk petroleum procurement remains a priority. To this end, we consider the work implemented to date on the regional bulk fuel procurement initiative to be relevant to Tonga and the region, and we are looking towards endorsing the Framework Agreement approach proposed to implement this initiative.

Pacific Island countries must address the ever present challenge of energy security and in this regard increasing reliance upon renewable energy, as a substitute for imported fossil fuel, must be fully explored. Outside of being able to address energy security, renewable energy options will also contribute towards global efforts to mitigate against climate change. Other mechanisms that we must consider as we address the challenge of energy security, both regionally and nationally, include implementing appropriate regulatory and pricing policies; and promoting energy efficiency and conservation in both supply and consumption.

Therefore energy and its security are without doubt, a matter of national importance in our development; and given the negative impact that higher oil prices have had on Pacific island countries and especially those with less diversified economies that are almost completely reliant on oil-based fuels for meeting their energy needs. In order to address this issue it is important that countries begin implementing energy efficiency measures and developing renewable energy resources, to reduce demand for imported oil-based fuels; and it is imperative that dialogue partners support these efforts wherever possible.

In light of the Pacific Islands Forum Leader’s decision to rationalize the functions of SOPAC with the work programmes of SPC and SPREP, Tonga supports either unifying all regional energy units and programmes into one agency, or the co-location of the various energy units and programmes of the CROP agencies in Forum member countries. For either scenario Tonga would like to register its interest as a potential host country.

Honourable Ministers, distinguished delegates, ladies and gentlemen; once again on behalf of the people of the Government of Tonga, I would like to welcome you. I am sure the agenda in front of you will not only be challenging but also offer the opportunity for enthusiastic debate. We will be looking forward with great interest to the outcome of your meeting and in particular, we hope that the issues of Energy policy and work programmes integrated into national planning; the need to look for realistic, affordable and sustainable energy solutions; the strengthening of regional energy coordination, and improved donor harmonization.

I would like to wish you all a fruitful deliberation and I am very greatly honoured this morning to declare the Second Pacific Energy Ministers Meeting open.
Keynote Address by Tuiloma Neroni Slade, Forum Secretary General at the Official Opening Ceremony of the Pacific Energy Ministers’ Meeting

Royal Highness Princess Salote Pilolevu Tuita; The Honourable Viliami Tangi, Deputy Prime Minister of Tonga; The Honourable Tuita, Minister of Lands and Survey, Natural Resources and Environment of the Government of Tonga; Honourable Ministers of Energy of the Region; My Colleagues, Heads of Regional Organisations; Heads of Government Ministries and other Government Representatives; Representatives of Development Partner Governments and Organisations; Ladies and Gentlemen ...

1. May I say that it is an honour, always, to be in the Kingdom. It is honour in double measure that I have been afforded the opportunity to be a part of this important meeting to provide this keynote address.

2. Honourable Ministers, over the next two days you will be asked to give consideration to a range of issues of fundamental concern and significance to our region, issues made all the more complicated by the global financial crisis which is still evolving, and evolving in ways none of us can predict with any certainty. It is a situation that lends particular importance to your task, and which invites for you as Energy Ministers a measure of special responsibility.

3. In recalling your work of 2007 I can report to you that Forum Leaders have acknowledged your vision of key actions and responses to the serious energy challenges confronting the region. Based on that vision, Forum Leaders have set policies committing regional Governments to action. Leaders have, in particular, through successive communiqués and under the auspices of the Pacific Plan, codified your decisions as best representing the actions required to address these energy challenges.

4. Energy is and will remain high amongst the region’s key priorities. Certainly, this is the clear direction from Forum Leaders. In their decisions of the Niue Forum last year, for instance, Leaders emphasised the need for continuing implementation of the Pacific Islands Energy Policy and the actions mandated under the Pacific Energy Ministers’ 2007 communiqué.

5. Recognising this, I want in these remarks to offer some observations which I hope may assist you in shaping the outcomes of this meeting and the directions you may offer as a result of your deliberations.

6. The question of energy, like no other, gives full exposure to the vulnerability of Pacific Island Countries. Nothing, as energy does, crystalizes or so clearly demonstrates the precarious position of small island communities and their inability to ensure any condition of security. Equitable access to reliable and affordable energy is a fundamental requirement for achieving national development; (and may I Deputy Prime Minister heartily echo those words which you have spoken of this morning). Predictable energy supply is critical in supporting economic growth and improving the delivery of basic services. Regional and international experiences demonstrate a clear correlation between the increased use of energy and national wealth measured as GDP. This accumulative experience further suggests that no country has substantially reduced poverty, increased human health conditions or improved access to education in modern times without massively increasing their use of energy. Energy is, inexorably, linked to the condition of human well being.

7. I believe that despite our best plans and intentions, we as Forum countries have fallen short of realising full potential for regional and national well being in any sustainable way and, dare I suggest, in any equitable way. The challenges all countries face in the region in better ensuring energy security are well known to Honourable Ministers, and for this reason I speak not of what we all know, but rather of what I believe we must address in pursuit of this common well being.

8. For all that we desire to ‘think and to dare for the future,’ there remains the imperative of today. For we need to address the here and now. The magnitude of what must be done should not be understated. All Forum member countries, from the largest to the smallest, have and must continue to grapple with the effects of climate change and the consequences of dependence on fossil fuels. It is not special revelation, but I say to you all, that renewable, sustainable and clean energy is and must be, unequivocally, our ultimate goal. It would be short-sighted however to neglect what can be done now to better relieve the very real pressures that many Forum countries face in meeting their energy requirements. Particularly, in our smaller island states.
9. This response will require a suite of innovative short, medium and long-term actions that are better coordinated. It is well known, and well acknowledged, that there is no magic formula that will ensure the security of energy supply overnight. No initiative envisaged by Honourable Ministers in 2007 of its own will mitigate associated economic pressures posed by ongoing and significant commitments to procuring energy supply, managing power generation and maintaining costly infrastructure. Much good work has and will need to continue to be implemented across the sector. Despite this, much more needs to be done to better coordinate the work of national, regional and international agencies in this area in our Pacific region. Our response must be collective, as must our view of what energy means for this region. Above all else, we need to be absolutely clear as to who does what; and we need clear articulation of the roles and responsibilities of regional agencies. I expect that in the course of your meeting you will hear viewpoints on this aspect, including from the Chief Executive Officers of the SPC, SOPAC and SPREP. I would, respectfully, highly commend to Ministers what my learned CEO colleagues will present to you.

10. Honourable Ministers, I believe we need to ensure that energy is viewed with broader and more strategic perspective. Energy cannot be thought of as somehow separate to issues of economic development, infrastructure, transport, climate change or food security. In failing to grasp the often understated ‘true’ value of energy, we open the door to increasing national fragility and in some cases the very viability of some communities. Geographic isolation and heavy reliance on imports, including fossil fuel imports, mean that many small developing islands states carry disproportionately high levels of risk, and with little ability to pursue policies of domestic import substitution. It is commonplace in all Forum countries:

- that fluctuations in the price of oil have a direct bearing on the price of food and other key commodities;
- that there are consequential impacts on the costs of transporting goods and services; or
- that the costs of maintaining infrastructure to manage generation, supply and distribution of energy are high and ongoing. These have been matters of concern for Forum Leaders before, they certainly were in the Niue Forum last year and, without question, will remain concerns for the foreseeable future.

11. With some emphasis I would contend that the continued pursuit of efficiency must remain an immediate goal. Improving national action to better support efforts in reducing heavy reliance on fossil fuels and wasteful energy should be the clear and central objective. In particular, I believe there is a strong and demonstrated case for integrated energy and economic development in national strategic development plans and policies (and once again I echo what the Deputy Prime Minister has said). Appropriate regulatory and pricing policies and programmes would be essential, as would be appropriate incentives for more efficient energy supply and energy consumption. I cannot presume to speak to politicians about political roles and responsibility, but, in all this, Honourable Ministers, I do suggest that political commitment would be crucial.

12. There are also the realities. Energy efficiency, inevitably, as with everything else, will have associated costs. These may be high, at least initially. Our response should endeavor to utilize all financial and technical resources available. These resources will be found within the region and without; and outside and must be complemented with commitments from national recurrent budgets. The commitment of national resources is the clearest sign of invested ownership. These resources should be accessed and managed in a coordinated way where possible ensuring a ‘whole-of-region’ position to better realise our common interests. Perhaps above all, efforts will need to be made to ensure that our actions are sustainable and supported by funding that is predictable.

13. As I close allow me to suggest that Honourable Ministers may wish to consider building on the acknowledged success of your work in 2007, and continue offering clear directions for Forum Leaders, regional Governments and technical agencies as well as international partners to follow. In doing so, I would, respectfully, encourage you to grasp this opportunity and to cast energy in the broader context of national development and economic growth, to consider how we may better coordinate our pursuit of energy efficiency and security, and to balance our big picture thinking with tangible and immediate responses, drawing on our collective experience to improve the well being of all the peoples of the Pacific.

May I thank you all for your attention, thank you.
Opening Speech by Lord Tuita, Honourable Minister of Lands and Survey, Natural Resources and Environment of the Government of Tonga at the Official Opening Ceremony of the Regional Energy Officials’ Meeting

STRENGTHENING THE FRAGILE PACIFIC ISLANDS ENERGY SECTOR

Addressing energy, economy and environment in a period of rapid change

DIRECTOR of SOPAC and Head of CROPS; Head of Delegations; Donor Partners; Ladies and Gentlemen …

In previous Regional Energy Meetings we have reaffirmed that energy has a vital role in achieving sustainable development in the Pacific region. It is a fundamental input to most economic and social activity and prerequisite for development in other sectors such as health, education and communications.

The challenge for many of our Pacific island countries is to accord the appropriate level of support and commitment to energy at the national level, by effectively integrating it into national planning processes and embracing the principle of equitable access to clean, reliable and affordable energy.

Renewable Energy can reduce the PICs’ dependence on fossil fuel thereby reducing the growth rate of Green-House Gas emissions from fossil fuel use. In addition, it can provide cleaner, more reliable and cost-effective energy services that are needed for the sustainable development of the Pacific Island Countries. The Green-House Gas emission to be saved from our Renewable Energy effort is negligible on the global scale but it provides much-needed opportunities to support sustainable development.

Therefore, we face three major issues in the energy sector in the Pacific. First, we need to have stability in the energy market, recognizing the continuing role of fossil fuel, but the need for more diversification. Secondly, the important role that the energy sector plays in our climate change ambitions. Lastly, we need to ensure energy security without becoming protectionist.

This is why we are here today; we are here to strengthen the fragile Pacific Island in addressing energy, economy and environment in this period of rapid change. It is imperative to maintain the momentum generated in the past Regional Energy Meetings, to continue our efforts against market volatility through our petroleum bulk purchase initiative and to move toward an energy course of action that is both appropriate to the Pacific and consistent with our climate change ambitions.

Tonga, like any other country in the Pacific region, is predominately reliant on imported fossil fuels, making us particularly vulnerable to irregularities in fuel costs and supply. However, we have ample renewable energy resources in the Pacific. In many cases these cannot be economically developed due to constraints imposed by: small and dispersed populations, poor infrastructure, poor coordination at regional and national levels, technological constraints such as the inability to store energy, and limited financial resources.

Today, diversify our energy economy through investment in renewable energy sources and in energy efficiency. A full range of renewable energy technologies are being tested to applied in both small and large scale. Some of the technologies and energy efficiency measures, particularly with some photovoltaic applications, are now technically mature and proven. Recognizing their role and potential, care must taken to ensure that any new developments first address the reasons for past failures, including poor projects planning, unreliable components, inappropriate design, improper installations and poor maintenance. In this respect, full advantages should be taken of the experience of other countries, so that errors committed be avoided, and thus Pacific Island Countries could literally “leap frog” over some of the steps and difficulties experienced in some countries. Regional cooperation and collaboration among ourselves, counties of the Pacific, should be encouraged and supported on order to avoid unnecessary duplication of the past failures.
Priority should be given to saving energy rather than generating energy where possible, and to improving efficient through the use of demand-side management and more efficient appliances. Above all, priority should be paid to the obvious successes. The experience of the Pacific, for instance, and possibly elsewhere, is that large scale renewable energy sources could play a substantial role in the electrification of both urban and rural areas. In this regard, I would like to acknowledge the close collaboration being made by various Donor Partners, Governments and the CROP agencies.

The possibilities of renewable energy in our respective countries are limitless. But to truly harness its potential, we urgently need people like you, with real effort to promote Renewable Energy from our respective countries. More innovation and ingenuity that helps lead the way on sustainable renewable energy in international regional and national levels. This is an industrial change that we should be willing to make. It's a change from conventional sources of energy to Clean Environmental Friendly Energy Sources. We have donor partners, entrepreneurs and small business who provide the innovations and initiatives to facilitate such transformation.

The Fourth Report of the International Panel on Climate Change justified that Global Warming is a reality, hence our climate is changing. Our own sea-level monitoring stations in Tonga, shows a 10 millimetre rise in the last 13 years. Climate change has impacts on the Pacific environments so we must make the adaptation effort to combat renewable energy barriers such as Green House Gas emissions.

The Pacific countries' First National Communication under the United Nations Framework Convention on Climate Change (UNFCCC) show that out main source of Green-House Gas emission is from our own energy sector. Tonga’s emissions from the energy sector have now reached 110Giga-gram Carbon Dioxide equivalents and all come from petroleum fuel combustions. In the past two decade, (Tonga’s total Green-House Gas emissions were equivalent to 27.26 Giga-gram Carbon Dioxide equivalents). Over the period 1991 to 2000, the average annual growth in overall emissions has been 5.04 percent.

Based on the above figures, I understand that removing all the identified barriers will not be easy. It will not happen overnight. It will not come without cost or sacrifice. But it is possible. It is necessary. And we, the Pacific islanders, prove that we have the will and the commitment to strengthen over fragile Pacific Islands in addressing energy, economy and environment in this period of rapid change.

On that note, I trust that you will have a successful deliberation on this important theme in the next few days. I do hope that you will find time in your busy schedule to enjoy our Tongan scenery and hospitality.

Malo ‘Aupito
Opening Comment by Cristelle Pratt, Director of SOPAC at the Official Opening Ceremony of the Regional Energy Officials’ Meeting

Honourable Minister for Lands, Surveys and Natural Resources Lord Tuita; Honourable Ministers of the Crown; Chair of REM; Representatives of member countries; Heads and representatives of CROP agencies; Development and donor Partners; Ladies and Gentlemen …

On behalf of SOPAC and core members of the CROP Energy Working Group I would like to extend a warm welcome to each of you for travelling to this wonderful venue in Tongatapu to discuss how we may participate positively in STRENGTHENING THE FRAGILE PACIFIC ISLANDS ENERGY SECTOR through addressing energy, economy and environment in a period of rapid change. That as you are all aware is the theme of this officials meeting as well as the 2nd Pacific Energy Ministerial Meeting to be convened here in a few days time.

When officials and ministers convened two short years ago in Rarotonga, Cook Islands it was against a backdrop of bludgeoning increases in fuel prices that were pressuring our small economies and our lifestyles into crisis situations threatening our security and stability.

Over the next days we meet with a slightly different backdrop; a backdrop of a world in economic crisis. As all things are so inextricably linked and as energy underpins and is an imperative for our socio-economic status and wellbeing the current slow down due to the global economic crisis (which have included a marked decrease in the price of oil) should not be reason for us to become complacent and to rest on our laurels. History has shown that the world’s economy will recover and with that will come comparable demands and competitiveness for energy and other commodities. Therefore the respite that we have been offered must be used pragmatically and effectively so that we are prepared when fuel prices increase again. I trust that we will not delay implementing initiatives that will result in us being more efficient in how we use and conserve energy because the incentives are not as great in the current climate of fuel prices being slightly more affordable than they were just last year. In addition I trust that our efforts in exploring alternative energy options to reduce our dependency on fossil fuels also remain a priority but within the context of what are appropriate and viable for our situation.

Due to the whole-of-country development implications that energy has we must ensure that it remains a political priority and we must ensure that they understand why this must be. The testament of this will be demonstrated in countries national energy policy and energy priorities being mainstreamed in national development planning and enjoying the necessary budgetary commitments that are required to achieve these.

Last year I commissioned an independent review to address the coordination and implementation mechanisms of regional energy initiatives. I commend this review to you and commend Peter Johnston for the report and the suggestions that he has made. We will have an opportunity to discuss key elements of the report and decide on how we cease opportunities that are suggested within it in order that we move forward and STRENGTHEN WHAT REMAINS A FRAGILE PACIFIC ISLANDS ENERGY SECTOR in a period of rapid and interesting change.

I look forward to the debate and the decisions during this meeting that will tackle some of the issues around how we can coordinate better and deliver more sustainable solutions. I would offer that the discussions must consider both the regional and the national dimensions for better coordination; that we must not confine ourselves to the regional institutional frameworks but be inclusive of all key actors and how we stretch our ability to strengthen coordination to deliver better outcomes for pacific communities and pacific economies.

As many of you are aware within this period of rapid change the region has been working toward regional institutional reforms of its various CROP agencies. It is very likely that from January 2010 implementation of new institutional arrangements will commence in earnest. Again in this respect there are opportunities for the regional energy sector to get things right. This meeting and the ministerial meeting to follow can provide some invaluable guidance on ensuring that the recommendations that go to the Leaders in respect of the proposed new institutional arrangements for energy services are rational and that these will result in improved energy services to our island member countries. I hope that the regional reforms will be a catalyst for strengthened coordination and harmonisation beyond its implications for SOPAC, SPREP and SPC alone but that it will be infectious and spark improved coordination at all levels and among all energy actors.
Clearly it will require considerable and concerted efforts – however, by agreeing that improved coordination is essential – whether this is through co-location of agencies or through consolidation and rationalisation of energy services that are currently being provided by various agencies or by forming a broader and meaningful alliance of all energy players (including donors) or through a combination of all of these – we are half way to succeeding. If we are to succeed such consolidated efforts will travel some significant distances to ensuring that available resources do target strategic energy priorities which can be absorbed and which will deliver enduring development outcomes.

Effective regional coordination can only have a positive effect on the support offered to member countries as it should reduce the burden on often understaffed and under-resourced energy offices that currently have to entertain a multitude of initiatives and overtures from regional and international partners who jostle for attention and space in a crowded agenda. It is not to say that these are unimportant – they are and they are necessary to support national efforts to realising sustainable development objectives and aspirations. It is more to suggest that we should give time to reflect on how we could improve our coordination, cooperative and collaborative approaches to STRENGTHEN THE FRAGILE PACIFIC ISLANDS ENERGY SECTOR at regional, national and local levels.

I look forward to the discussions and deliberations during this meeting and I encourage all participants to contribute to ensure that the outcomes of this meeting will address and realise the conference theme.

Thank you.
Republic of Kiribati (delivered during Ministers’ Meeting)

Hon. Chairman; foremost, I wish to join others in congratulating you as an Honourable Chairperson and the host for this Pacific Energy Ministers Meeting 2009 and the associated Regional Energy Official Meeting in this magnificent convention centre.

Kiribati whole heartedly has the confident that you will steer the direction of this PEMM2009 successfully to come out with a constructive and beneficial outcome in addressing the impediment energy issues and concerns as faced and experienced by the Pacific Island countries.

Hon. Chairman, allow me through your good-self, to sincerely thank the friendly people and the Government of the Kingdom of Tonga for the warm welcome and hospitality extended to our delegation since their arrival on this beautiful island of Nuku'alofa. I would also like to express our word of thanks for the National Energy Officials, SOPAC and the CROP Energy Working Group for their excellent facilitating of the REM2009 where they had come up with recommendations which will lead our deliberations for this imperative ministers’ meeting.

Honourable Chairman, as a representative from the Kiribati Government on behalf of Honourable Kouraiti Beniato the Minister of Public Works and Utilities who could not attend due to the commitment with the House of parliament sessions now in its first week, I am indeed honoured and privileged to convey and deliberate on matters in this meeting expressing the views and comments per se for Kiribati regarding the following issues.

Hon. Chairman, Kiribati Government expresses its acknowledgement for the PEMM-2007 Communiqué deliverables in particular the need for all Pacific Island nations to have national energy policy and action plans. Kiribati acknowledges the proficient facilitation from SOPAC and PIFS during the development and EDF Regional Technical Cooperation Facility for funding the policy development processes. I wish to inform Pacific Energy Ministers that Kiribati now has a comprehensive National Energy Policy.

With regards to the Pacific Petroleum Project, Kiribati at this stage could not participate due to the existing binding contract between KOIL and Exxon MOBIL, however we are ambitious to learn and gather constructive assistance for progressing on the matter and bring back for my government to review.

Hon. Chairman, with regard to the continued support and assistance from our development partners, I wish to convey at this meeting the people and Gov of Kiribati acknowledgement and sincere gratitude in relation to the RE. Specially I wish to take this opportunity to acknowledge the assistance from the EU, Italy-Austria-Milan Municipalities and UNDP, REEP funded RE projects that are now on their way for implementation. Kiribati is very keen to pursue in expanding the existing solar PV projects for the rural electrification for improving the livelihood and elevating the standard of living of our rural dwellers. The Kiribati Gov through its development plans is promoting the energy supply mix from RE to the current electricity grids on urban centres on Tarawa and Kiritimati Islands.

Hon. Chairman, Kiribati have not progressed significantly in the Energy Efficiency and Conservation implementation due to national capacity and funding constraints, however Kiribati is very keen to progress on EE and EC and would request our development partners for their cooperation assistance in progressing the initiatives.

Hon. Chairman, Let me conclude by appealing to Honourable ministers to focus on concrete ACTIONS in addressing recommendations and other issues in front of us.

I thank you Honourable Chairman
Republic of the Marshall Islands

Mr. Chairman, Heads of Delegations, Madam Director, Development Partners, Distinguished Guests and Resource Persons, SOPAC Staff, Ladies and Gentlemen:

I want to begin my brief remarks this morning by associating myself and our delegation with all the previous speakers in offering our congratulations to you, Mr. Chairman, upon your election as chairman of this very important meeting of regional energy officials. I am confident that through your able leadership, and in keeping with our Pacific Way, we will be able to navigate our way through the imposing agenda before us, and in so doing, arrive at practical, yet, forward-looking policy recommendations for our Ministers to consider.

But before continuing, it would be remiss of me not to acknowledge the excellent arrangements and logistical support provided by the government of the Kingdom of Tonga and the SOPAC Secretariat to enable our participation at this important meeting. I also wish to thank the Tongan people for the warm hospitality extended to members of our delegation since our arrival in your beautiful country.

Mr. Chairman, Ladies and Gentlemen, I am pleased to refer to the Pacific Energy Ministers Declaration and Communiqué of 2007 which “[r]ecognized that energy security is an imperative for economic growth and human development and further that Pacific economies are the most vulnerable in the world to rising oil prices…”

Mr. Chairman, I don’t think I need to underscore the relevance of this observation, particularly in terms of our vulnerability to fluctuations in global oil prices. In the case of the Marshall Islands, in July of last year, our government had to declare a state of emergency because of rising global food and fuel prices.

During the third quarter of 2008, inflation in the Marshall Islands reached an alarming 29.4% because of high prices of imported fuel and increases in the price of electricity, transportation, and stable food items such as rice. At the same time, GDP grew at an estimated 1.5% for all of fiscal year 2008. Obviously these economic trends are not sustainable.

Mr. Chairman, If one were to look at the fiscal condition of our nation during the 2008 period, one would see very clearly that expenditures in the energy sector was out-pacing all other sectors. Fuel imports accounted for almost 20% of our national budget for 2008.

What is more alarming is the fact that the funds that were used to pay for the imported fuels had to be diverted from capital projects and from government contingencies. In other words, not only were we paying more for the same amount of imported fuels, we were taking away from critical capital projects that would have otherwise infused funds into our private sector and our economy.

Despite these difficulties, or more accurately because of these difficulties, I am pleased to report that many positive steps have since been taken to address many of the deficiencies in our energy sector.

In this regard, Mr. Chairman, I want to acknowledge the assistance of our many development partners who gave generously in terms of funding, technical assistance, and advice after our declaration of emergency in July of last year.

With your indulgence, I would like to highlight some of the actions we have taken, both at the practical and policy levels, as a measured-response to the energy crisis we faced in July of 2008, and continue to face today:

• First, with funding assistance from the Asian Development Bank, we were able to secure the technical services of two energy experts to conduct a rapid assessment of our energy sector to give us a starting baseline to work from;

• Second, with EU funding assistance, we were able to engage the services of the same two energy experts to assist us with the development of our new National Energy Policy and Medium Term Action Plan. These two documents are slated to be completed this summer in June;

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2 Asian Development Outlook 2009
3 EPPSO
• Third, with funding from AusAID and through the Australian PACTAM program, we were also able to secure the services of an energy adviser for two years to be attached to our energy division. As a matter of fact, Mr. Nicholas Wardrop, who is here with our delegation, is the PACTAM energy adviser I am referring to;

• Fourth, I think it is important to mention that when the emergency declaration was issued in July of last year, we had one technician in our energy division. Now, with Nick on board, we will have four bodies in the office, which is three more than what we had at the end of 2008.

• Finally, there are valuable inputs to our programs from other donors such as Italy/Austria, Taiwan, Japan, the EU, and the USA.

Mr. Chairman, I do not want to take more time than I have to, since we have a full agenda before us, but I think it is important for my delegation to raise an item that has been before us for some time now, and that is the concept of petroleum bulk purchasing. We believe it is high time the region revisits this issue with all seriousness. Concrete steps must be taken now to make sure an actionable plan can be put into place so that the issue is not relegated into the background for another 10 years.

Experts tell us that it is not a matter of if, but rather when the prices of global fuel goes up again, bulk purchasing could be the only thing standing between our ability to provide power to our people and black-outs.

In the case of the Marshall Islands, we realize that many of the measures we are implementing today to lessen our dependence on imported fuels will take time. The fact is that we will continue to rely on imported fossil fuels for the foreseeable future so we must act together to ensure that our fuel supply can be secured at prices that are reasonable and internationally competitive.

In conclusion we would like to stress.

1) The energy crisis in 2008 was yet another reminder of just how dependent most of us are on fossil fuel energy and just how exposed we are to unforeseen shocks.

2) We currently have a window of opportunity to really make improvements in the areas of energy efficiency and renewable energy. We need to develop new policies and strategies that accurately reflect the new global realities and ensure that both supply and demand side efficiencies are made.

3) Donors and development partners should support energy reform and re-planning in this new era and help the Pacific prepare for the inevitable rise in fossil fuel prices.

To this end, we concur with the need to substantially improve the mechanisms for Energy Sector cooperation and coordination amongst CROP agencies, and with CROP and donor agencies. We respectfully suggest that a single, long-term agency should be charged with this task here in the Pacific.
Introduction

The Chair of the Ocean Session, Mr Rupeni Mario (SOPAC) called the session to order and presented the working procedure for the session. He also welcomed participants to the session particularly the presenters and introduced the facilitator, Dr Ajal Kumar of the University of the South Pacific.

Dr Ajal Kumar (USP) introduced the session and the four presenters highlighting that Pacific Island Countries (PICs) have a good understanding of the proven and well-established technologies such as wind, solar, hydro and biomass. Ocean-based renewable energy technologies is a new area and the session would focus on some of the technologies that have been commercialised or are near commercialisation. The presenters were introduced as follows:

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<tr>
<th>Name</th>
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<tr>
<td>Anthony Derrick</td>
<td>Managing Director of IT Power based in UK; has had experience working in the Pacific when he was doing a consultancy on an EU-UN paper “Energy as a Tool for Sustainable Development for Small Island States”. At the inception phase he was Programme Manager for the REP-5 Project.</td>
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<tr>
<td>Barbara Vlaeminck</td>
<td>Director of SRP; SRP is a limited private company based in New Caledonia set up in 2005 and has done some preliminary studies in the Pacific in terms of wave energy. It was a privately-funded company initially and established in 1982 with six permanent staff mostly engineers and with an aim of delivering services and projects of new technologies aiming at a sustainable development.</td>
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<tr>
<td>Garry Venus</td>
<td>Director of Argo Environmental Limited, New Zealand; The Argo Environmental Limited is an Environmental consultant focusing on environmental and resource projects. Argo Environmental has a 20-year history of energy development; in hydro and geothermal and in the last 5 years started working on marine energy generation starting off from the Kaipara project but looking at others.</td>
</tr>
<tr>
<td>Andrea Athanas</td>
<td>Senior Programme Officer, Energy, Ecosystems and Livelihoods Business and Biodiversity, the World Conservation Union (IUCN).</td>
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The presentations by the above resource people are attached to this summary record.
PLENARY DISCUSSION

Questions 1 – Do Pacific Island Countries have relevant temperature gradient or enough tidal power to generate energy from the ocean?

IT Power reported that there are some temperature differentials in the ocean as well as tidal current around the Pacific but still not as great as in other areas of the world. The question always comes down to the economics and whether an appropriate technology is available at the present time. The technology is not yet there but potentially in the future the technologies are economical given the recent renewed interest to invest in OTEC. There is potential for wave and tidal power but several years away. Let the UK and EU countries spend their money now to get the costs down through their installations and then have a fix on the economics and looks at its relevance to the Pacific situations.

The Northern Hemisphere focus such as UK is predominantly focused on high yield areas with massive tidal current for 15 MW tidal generations. But it is worth considering the PICs for local situations such as soft lagoon with reasonable current, not massive high current where there is a possibility of deploying small-scale generation project such as the system used in river situations so it is basically local solution to a local problem. There may be a possibility of putting together a combination that looks at generating relatively low level of electricity which could be disproportionately available at local scale.

Wave resources in the Pacific are less powerful compared to the Northern Europe, but at least the Pacific region have non-seasonal waves that is regular that does match quite well with the energy consumption. Promoting the advantages of wave energy such as reducing the use of land maybe useful.

Republic of Marshall Islands raised a concern on the human resource issues. There are a lot of things that the Pacific need to use which are proven technology and the concern was diversion of scarce resources. The Pacific could lose or spend the money to prove things therefore it may be prudent to maintain watching briefs on the technologies while the larger countries who could, do spend the money to prove things before the smaller PICs get involved. The other issue is to get technologies that are small and economic. The impacts of the new technologies on human resources and capacity building within utilities would be similar to the wind turbine into grids technology; implying that similar issues would be associated with marine turbines therefore translating into diversion of resources.

World Bank highlighted the large number of feasibility studies and the efforts that have gone into them; i.e. the hydrology and bathymetry studies for a marine energy feasibility study, which is comparable to efforts that go into a hydro feasibility study.

SPR highlighted that full feasibility studies on wave technologies (seabed nature and bathymetry) can cost as much as a million Euro for a complete feasibility study. Generally data collection can be done by countries and become available for project developers. Wave resources measurements can cost up to 107,000 Euro.

IT Power confirmed the similarity in the levels of required effort for hydro feasibility and marine energy feasibility studies.

IUCN pointed out that one of the major sources of revenue for the island countries is tourism so maybe a way forward is to put in place regulatory measures that these technologies do not in any way impact the tourism aspects. As shown in the New Zealand presentation where the placement of big wave instruments/machines in a place of scenic beauty took away some value, so if these machines are going to be considered for the Pacific; it was advised that some regulatory measures should be considered beforehand.

Egro New Zealand completely agreed and that this was the whole key to proper planning and addressing all environmental impacts in the process. It was important that there were procedures in place so potential developers would be very clear on what the expectations were.

IUCN offered that there was the role of stakeholders’ engagement in the EIA and consultation process. Those who would potentially be impacted by the development, e.g. tourism industries, fisheries and local communities should be involved in the process. Robust EIA practices can help ensure that energy installations are compatible within and in fact benefit local communities.
UNELCO made a general point that the promotion of renewable energy had been thoroughly discussed during the meeting so far. He thought that officials needed to convince certain key people that energy installations like wind turbines were beautiful. The choice was between burning diesel fuel and looking at wind turbines and he suggested that officials needed to be more convincing about arguing that energy installations were beautiful because they brought energy and he was certainly going to do his bit along those lines in Vanuatu.

Question 2 – With the ocean-based technologies heading into the Pacific; have these same technologies been through the experience of cyclones?

IT Power answered that in the United Kingdom and Scotland offshore climate are often extreme; sometimes, there are devices that suffered dramatically from under-estimating the power of the waves but these things are designable. One consideration is that some of the devices are underwater and were therefore to some extent shielded from extreme waves.

SPR reported with respect to the Pelamis machines they were familiar with, that there were two risks: (1) the wind; and (2) the wave that would be created by the cyclone. The wind does not have too much of an impact as only a small part of the machine is above water; but the wave could be damaging. What is done when doing the complete study is to also look at the climatology of the wave during the extreme weather event, like the cyclone. For example in New Caledonia, a potential 21 m wave height was calculated and therefore the machine has been designed for a 29 m wave height. So far the most extreme wave experienced was in the vicinity of 12 m so the machine can theoretically survive a worse event.

Nauru commented that they had not forgotten about the alternative OTEC technology since the last OTEC in Nauru (31 kW capacity). The Nauru installation unfortunately did not last long due to a disaster. The system was only feeding into the grid at the time it was established. Nauru has not forgotten about the OTEC technology as an alternative option for electricity supply, even after their experience with OTEC. Nauru stressed their continued interest in OTEC and welcomed discussions. They also welcomed presenters and developmental partners that may be interested in the challenge of lending Nauru a hand to re-assess and pursue this option.

SPR used the opportunity to rephrase a question posed during their presentation. Would one of the development partners capable in the sense of rules and criteria to elect some funds? Would partners be attracted to funding the feasibility studies that need to be undertaken and/or at what stage should developers contact potential donors and how should developers move forward on how studies could be funded?

Question 3 – Given Nauru’s OTEC experience and the mechanical systems presented, which is the more appropriate for the PICs and why?

IT Power offered that it would take different applications for different countries; and it is still unclear on which technology would enjoy success in each area. IT Power recommended that officials keep up to date with the technologies by looking at international energy agencies and social energy groups’ quarterly newsletter on ocean energy to get a feel for what other technologies might be coming on board.

The OTEC for example, has a fantastic long term potential when looking from the resource perspective. OTEC works but to date the economics are not proven so the question is when would a commercial product be available that would be reliable? It is difficult to say what would be the best option in the long term and therefore repeated the recommendation that countries maintain a watching brief on those technologies through organisations like the International Energy Agency; and he noted that there was conference on ocean energy coming up soon in New Zealand as well – while at the same time feasibility studies would help to identify which particular technologies are most appropriate.
Al Binger from CCCCC earlier presented along with colleagues from SPREP some very detailed numbers on the costing of OTEC systems. For those really interested in OTEC, there is a 30-kW working plant at Kyushu at Saga University situated in Imari [Japan] which has been operational now for more than 5 years; so there is enough data available to basically make the projections as to what the cost is.

The big unknown in OTEC is the bathymetry; and estimates have that 40% of the cost is in the pipeline, so you have the option of whether you base the plant offshore in which case you look at an oil rigging type of structures or you basically bring the three water pipes onshore. His view was that the idea of OTEC being somewhere in the future is really not so accurate anymore. OTEC is not a new technology; and when new renewable energy technology is discussed OTEC is there like in this instance, like doing a OTEC a big favour. The first paper on OTEC was written in 1881 but the problem with OTEC and the nature of the resource is that it is basically confined to tropical oceans and where the bathymetry is very fast so that there are no long pipelines. So for groups of countries who are interested in OTEC he thought that the countries needed to make it happen for themselves; and he suggested a small consortium of island states that have a vested interest to actually push the donors to help. With what is about to happen with climate change, OTEC is a wonderful adaptation technology because if the loss of aquifers and freshwater supply occurs due to sea-level rise this could be one way one could actually change the economics.

Looking at the cost to desalinate a litre of salt water in terms of energy versus having it produced by OTEC as a by-product, it is notably orders of magnitude cheaper. A look at the end products –the exhaust water comes out at about 12 to 14 degrees Celsius which is ideal for mariculture. He advised that when looking at the technology not to base the economics on the energy alone but to look at what it contributes to the sustainable development of an island state. Most that do understand OTEC don’t view it as an energy technology but rather as a sustainable development technology; and in that context makes OTEC very different from the other ocean energies. He emphasised that maybe the issue for small island states was how to collectively work together to advance the knowledge and disseminate the information so that it became a part of the renewable energy menu.

European Commission provided a donor’s viewpoint on their work in the Pacific and other regions. The European Commission was trying its best to ensure they disseminated only proven technologies in renewable energy; and that they actually work on the ground in these countries. They found it to be quite difficult and challenging to have these working. Apart from RETs, they see great potential in terms of energy efficiency both in the supply side and demand side. These activities also need funding and funding is limited whether through grant or loan financing. What can be best for the region is to let the western countries develop these technologies, make them suitable for the region and look at them in the future.

According to the speaker, the presentations heard were rather conservative in terms of what was actually happening. He had attended various conferences in Scotland that were held every two years and presenters are right on the other end of the scale in terms of where the industry is. It was quite possible that there was technology that was applicable for local applications here that are already around, apart from small-scale in-river generation applications. The difficulty is that the Pacific could not wait for the European countries turbine developers to finish as they are looking at higher yields environment that are not typical of the Pacific; hence there was a gap and a need to focus on the lower-yield technologies.

UNDP concurred with the view from the EU. He advised a focus on reliable and proven technologies that work in the Pacific countries. He informed the meeting that the Tokelau National Energy Policy has concluded that it would focus on technologies that have worked for at least five years in the PICs or in a similar setting and they would not consider any other technologies; this was a good guiding principle. Proven commercial off-the-shelf technology was probably the best option.
Question 4 – Is it too early to develop a roadmap for this ocean renewable technology or should the PICs concentrate on whatever proven technology and forget about OTEC?

**IUCN** counselled that during the preparatory work that environmental considerations be a reasonable first step at the time of site assessments so that when the technology were in line for implementation the developers and those receiving the technology were ahead of the game in the more practical sense.

**Papua New Guinea** commented that the maintenance of the technology was also to be a prime consideration before introducing any technology into a country. In the late 1970s, there were technologies brought into countries, e.g. the charcoal gasifier – there was no interest in the project to sustain the technologies and the major problem was the lack of maintenance and interest in maintaining the system.

**Nauru** responded to earlier suggestions for pursuing technologies that are proven now. In the unique case of Nauru they needed to explore every option applicable and did not wish to be limited; so that they fully explored the opportunity to achieve their renewable energy targets.

**Tuvalu** suggested that given the difficulties with introducing new technologies into the PICs that training be undertaken within PICs to develop the ability to do their own feasibility studies rather than spending millions; so that when developers came into countries, data required was available and probably by that time the technology would be viable.

**World Bank** noted what other donor colleagues have mentioned in general about aiming to use commercial technologies because as sometimes these new technologies may add up to the complexity of the current technologies. The type of technology applicable in the north was not going to work in the South and if PICs were to wait for appropriate and proven technologies, this might take fifteen years of waiting.

The proposal from Al Binger that SIDs should get together and build a lobby group demanding that there is a need for development of ocean technology that was appropriate and worked in the small island environment. World Bank was not committing but was certain there would be sources of financing that could be interested to take this on if there was a strong enough lobby for it. So the idea of getting together and making the case for work to start on appropriate technology that was feasible for this part of the world was better than just waiting for something to happen.

**SRP** offered that identifying the devices and undertaking the resource assessment studies could be done in parallel.

**IT Power** pointed out that the EC was supporting technology development indirectly in Europe; however most of the money was going into larger units. Many technologies under development are modular, so 1-2 MW (small) tidal current units for shallow water have also been developed and are being developed, although to a lesser extent than the larger units.

**New Zealand** observed that the environmental lead up time in terms of getting resources information and other environmental stakeholders’ views also takes time so that the technology evaluation and adaptation should also run in parallel in general with environmental considerations.

**IUCN** recommended establishing the kind of ownership and regulatory frameworks to provide a mechanism for incentive for maintenance of the equipment. Also, the regulatory framework should ensure that the seabed ownership issues are addressed and put in place.

**Republic of the Marshall Islands** commented that when the countries should club together and that perhaps resources and finance should be brought forward so that may be needed in the coming future.

**Al Binger** advised about some new technology developed by Google that can scan lots of bathymetry. He had started looking at the bathymetry collected by this technology, at close to 1000 meters would mean a lot of the information that would be needed would be available. He said it was a lot cheaper to fly around and use sonar to map the bathymetry. He prompted that maybe SOPAC or SPC or one of the agencies in the Pacific who has resource assessment in their portfolio to look at providing good information. Fiji, he said, had developed some OTEC sites so there seemed to be some information already available to work with.
SOPAC informed the meeting that SOPAC does do these assessments through its Ocean and Islands Programme. A good portion of Pacific shallow-water bathymetry has been collected and so this information is available.

IUCN mentioned that Google also has the conservation priority areas indicated, particularly for the marine environment so that it was possible to overlay the information and determine where you can avoid environmental impacts.

Question 6 – OTEC has been experienced in Nauru but the island resource needs assessment after the accident that stopped operations and why was the installation not rehabilitated? What will be the fate of doing a similar project?

IT Power pointed out that this fell under the need for feasibility studies and resource assessments being worth doing.

Al Binger informed the meeting that the original project in Nauru was developed by Kyosu Electric Utility in southern Japan and was based on the open cycle, which was not the most efficient system so when the cold water pipe broke it was its second failure; and it was decided that it was not sensible to try to re-habilitate it using the open cycle as other efficient cycles have been developed. Also, Kyosu just lost interest in the project.

**SUMMING UP BY THE FACILITATOR**

**(Ajal Kumar of USP)**

It seems clear that OTEC is still being refined and while it is being refined PICs need to develop their human resources so that when the technology is introduced the manpower is ready and able to implement The appropriateness of the technology depends on where it would be placed. A 7-MW OTEC system is operational in Canada; however for small island countries’ economies, geographic isolation, and costs of small-sized installations are challenges that need to be overcome. In terms of resource assessment, the Pacific will need time to assess resources. SIDS also need to collaborate to identify suitable technologies and do a collective proposal. Finally that some work has already been undertaken by SOPAC in terms of resource assessment, which data can be accessed beginning at the SOPAC website.

The session closed with a cocktail hosted by IT Power
Presentations

1. An overview of Ocean Renewable Energy by Anthony Derrick, IT Power

Ocean renewable energy has four key categories:

i) Tidal, which involves extracting energy from the flow of the tides, which is the result of gravity the pull of the moon.

ii) Wave power, involves extracting the energy from the motion of waves that is a result from wind disturbing the surface of the ocean.

iii) Ocean Thermal Energy Conversion (OTEC) involves extracting energy from the temperature difference between deeper and surface waters.

iv) Other offshore renewable energy technologies that do not extract energy directly from the oceans but use the ocean as a platform. These technologies are particularly common in the Europe and the United Kingdom (UK). In fact, in today's British budget, the British Government announced another 500 million pounds to support offshore renewable projects, such as floating wind turbines which are potentially of interest to the Pacific Islands.

One key difference between wind power and marine wave and tidal is that wind power is generally developed on the one concept of two- or three-bladed wind turbine horizontal axis. With marine energy, wave and tidal there are many different devices being developed so at the moment, there is no clear winner technology.

Ocean Power

There are different devices for wave power onshore and offshore such as buoys, oscillating water columns, overtopping devices and wave rotors; whereas tidal devices include the horizontal and vertical axis reciprocating wing rotors, tidal barrage/fence and tidal lagoon.

Tidal and marine currents are predictable resources unlike wind power and to a certain extent solar power which is unreliable, one can not accurately forecast what tomorrow will do. With tidal power you know what is exactly to happen in the future and you know exactly what to get from tidal turbines on the particular day and time. The tidal devices are also highly energy intensive because they utilize water that has a higher density than air. Tidal turbines certainly are typically smaller than a wind turbine. Studies showed that it is also potentially economically viable in certain locations and certainly in the UK, it is believed that it is definitely economically viable versus offshore wind power.

In addition, wave power is not a predictable resource but it is economically viable and competitive. UK industries have looked at developing offshore technologies and UK studies have estimated that the international market for ocean energy is around 120 billion pounds per year in the future.
Typical Tidal current Devices

The leading developer at the moment for tidal devices is the Marine Current Turbines (MCT) Limited. Figure 1 shows the first commercial-scale tidal turbine. Twin rotors under the water - Rotors rotate and traps water from both direction of tidal flow.

It is more expensive to install devices in the oceans compared to land.

Tidal resources estimates are quite enormous; the global estimate is 120 GW of exploitable resources. IT Power has been involved from the beginning as a result of working on river current turbines in the River Nile and suggested the idea of marine current back in the 1980s; but it was not until 1992, when IT Power got the support and right now 100 companies are developing technologies.

Types of Tidal and Wave Devices

France is the leading country in the world in the development of the tidal barrage (Figure 4) where they built a barrage at an estuary. IT Power has looked at that in the UK and has spent millions in doing feasibility studies. One concept is the idea of tidal fencing that do not block the estuary but just places rotors across the estuary to allow shipping passages and wild life to go through (see Figure 4). This concept does not extract as much energy but has less impact on the marine environment and ecosystem.

Tidal lagoons (Figure 5) is where you can impound the water at high tide and then let the water drain out at low tide through a turbine which also means that a man-made lagoon can be created to allow passage of ships and wild life.

Consideration for tidal currents needs resource assessment through data and information collection; as well as costing. The units at the moment are about 30 Euro cents per kilowatt hour (€0.30/kWh) but may fall. Water flowing in and out of atolls is something to consider for the Pacific, maybe combining turbines with the outlets. The key thing is that
there are no commercial products available yet and long-term operational experience which is important. When listening to developers who come up with optimistic claims, bear in mind, the question of what those claims are based on because there is no long-term operational experience. Also take the considerations of the grid and the utilities.

On wave power, the UK has good resources, which is also the case in New Zealand (NZ), Australia, Chile, and South Africa. One of the leading technologies is the snake Pelamis (Figure 6) that went to a commercial farm in Brazil; however they are having some normal teething problems; and financial considerations also need to be addressed. Wave power devices such as onshore oscillating water columns are now operational in Scotland generating electricity from water. One of the best is the floating platform which captures water and air between the crest of waves and therefore pressurises the reservoir - no heavy machinery floating or rotating in the sea. There are many other wave power devices currently under development.

**Ocean Thermal Energy Conversion (OTEC)**

It has been highlighted from the Caribbean experience that external combustion heat engines that have been running off the temperature difference between surface and deep waters have low efficiency. OTEC is a bigger resource than wind power and Small Island Developing States (SIDS) in the tropical areas often have the best temperature differences.

OTEC has been demonstrated in the 1980s in Hawaii and a 120-kW system in Nauru by Tokyo Power and Electric in 1981; so there has been some experience in the Pacific SIDS. But at present time no commercial product is known therefore costs are uncertain but there is renewed interest and there has been a recent press release on feasibility studies by some companies and corporations. There were some studies initiated for the islands of Reunion and Guam and Diego Garcia. It was mentioned that the by-product is often the desalinated water, if you use the flushing operation vacuum system.

Concluding remarks therefore are that there is no commercial product in wave, tidal and OTEC that have a proven track record of reliability, which is very important. IT Power has been managing developments for some companies, on tidal and wave power devices for some time, and we prove to be over optimistic. But the UK and other EU countries, Canada, United States, NZ countries are all supporting device developments in ocean renewable but costs will not come down unless those countries have significantly installed many installations and devices.

The long-term potential is significant and studies show that it might now be worth considering collecting data on wave power and resource assessment. Also research for further information from what is available; there is much literature on ocean renewables and different devices for harnessing ocean power being proposed at all times and therefore there is need to get a good source and concise overview of information from international agencies such as Ocean and Energy System Groups, (Australia and New Zealand are members) and New Zealand and EU Ocean and Tidal Energy Associations.
2. Wave Energy in Preliminary Studies in the Pacific
   Barbara Vlaeminck the Director of SRP, (Societe de Recherche du Pacifique), New Caledonia.

If wave energy can follow the trend as other technologies such as solar and wind, it looks promising in the future to reduce the cost. PICs should be looking at funding to carry out pre-feasibility studies, a pre-requisite to project implementation.

SRP’s main activities are around renewable energy, in particular wave energy. The company has invested in some marine measurement instruments to undertake studies, carbon footprint assessment, energy audits and project funding via carbon credits. SRP works on a methodology developed by a French company, ADEME, that assists companies in looking at where they actually emit too much greenhouse gas (GHG) and how they can reduce their emissions.

On the Clean Development Mechanism (CDM), SRP works on verified emission reductions with South Pole Carbon (a Swiss company) and has the ground people to work on these projects.

For marine measurements, SRP has invested in a few equipment for environmental impact assessments such as the Wave Rider Boat to make wave measurements, the small ROV (Remotely Operating Vehicle) for Environmental Impact Assessments (EIA) and some tracking systems for these devices.

The ROV has been used for clean projects called the SWAC (Sea Water Air Conditioning). One particular SWAC project is in French Polynesia, for beachcomber hotels on Tetiaroa Atoll where SRP has gone to 300 metres depth in this machine.

In terms of wave energy, in 2005, SRP talked to Pelamis, one of the most advanced wave energy converters and made an agreement with them to undertake distribution and feasibility studies in the Pacific and Indian oceans.

Pelamis the wave energy converter has become commercial with three machines installed in Portugal for starting in September to December 2009. Due to financial problems one of the machines had to be returned to wharf as customer could not pay for the kilowatt hours produced. The machines are working fine with a second type of machine sold; hence industrialization phase is starting. The units have been working for 10 years now.

In terms of what SRP has been doing in the Pacific, a wave resource assessment study was carried out in Wallis and Futuna, and Efate in Vanuatu. The study for Efate was partially done in collaboration with SOPAC, particularly with respect to the data on Vanuatu bathymetry. The study was partially funded by the French Fund called the Pacific Fund. SRP carried out some modelling at three potential sites in Wallis but these need further study to actually prove the models within the measurements. The outcome of the Efate site indicated less wave power but further studies are required for other interest areas of the island.

SRP has also completed a full feasibility study using Pelamis for a project in Maré, New Caledonia.

The feasibility studies on tidal and wave current does require more work than wind or solar assessment studies and therefore costs are higher.

Issues like those listed below have to be considered in carrying out feasibility studies:

- Bathymetry
- Sea bed nature
- Environmental Impact
- Wave/Current resource
- Grid connection
- Fabrication, operations and maintenance
- Permitting Issues
- Economics of the project
One of the outcomes of the feasibility study done in New Caledonia using one machine shows that it is not economically viable as the island does not have sufficient demand to economically use the power produced. The status now is waiting on the New Caledonia government to decide whether it was worth connecting the equipment to the Independent Power Producers (IPP).

In the La Reunion (in the Indian Ocean), SRP started a feasibility study using a second type of machine from Pelamis. It appears hopeful that fabrication could start in 2010 to prove the feasibility study on viability. This will be based on the second type of machine from Pelamis.

On the way forward, it appears that –

- it may be difficult to implement these types of machines (big machines) at this point, because of
- small grids and remoteness of the Pacific islands.
- Limited infrastructure such as cartage, wharves, and the
- early stages of the technologies might require that the machines are proved first prior to uptake.

There is still opportunity for cost effectiveness. The capital cost for each technology with accumulative megawatts costs can be reduced if ocean technologies can follow the trend of other technologies such as PV and wind turbines. The entry price in the market is quite acceptable and even lower compared to wind and therefore relatively promising for the future in reducing capital costs.

Although it is a long way away, there are some activities that can be done such as data collection, bathymetry, seabed characterisation, IPP frameworks, development consent, authorisations for installation and proper resources assessment (similar to solar map, wind assessment etc). The wave energy roadmap can be looked at in advance as the lack of resource assessments can also delay the developers.

Last but not the least, PICs can look at funding opportunities for doing feasibility studies which involves three main cycles, pre-feasibility studies (small phase), feasibilities (complete feasibility study) and project implementation.

3. Can Marine & Tidal Energy Projects work in the Pacific,
   by Garry Venus from Argo Environment Limited

Some in-river units could provide appropriate technologies for small-scale generation for atolls at less expense for the Pacific Island Countries.

The presentation from Agro Environmental Limited focused on two examples of projects that are currently underway in New Zealand. Examples are to illustrate some of the potential issues associated with marine energy generation from the perspective of trying to get things done in the Southern Hemisphere which are far removed from suppliers of plants and so on.

The two projects are privately-funded projects; the Kaipara Harbour (marine turbine) and the Chatham Island (wave energy). The Kaipara Harbour project is located at the Kaipara Harbour just north of Auckland. It is a very large harbour or arguably the largest enclosed harbour in the world about 947 km² in area with over 300,000 km linked shore line with a very large tidal prism and tidal range of nearly 2.7 m at spring tides. Therefore there is a massive amount of water going in and out of the harbour at each tide, something like 2 billion cubic meters per tide through a relatively narrow entrance. It generates peak velocities in excess of 2.5 m/s or 5 knots and those velocities occur through the water depth at the entrance. At the entrance there is water in excess of about 30 m; so it is a very good resource from that point of view but on the global scale, it is not high up in the highest range but there are other attractions for it.

The project is for a 200-MW tidal farm or power station using the technology from the company called Open Hydro but in the consent process, the company allows for a 10-year lapse period so developers have 10 years to deploy the turbine – enough time to get the project up and running anticipating that the technology would improve over the next 10 years, so the pick of the best technology can be made when it is ready.
This is an important point to bear in mind when looking at marine energy – a lot of work is required where a huge effort is required up-front. Unless this upfront work is undertaken a project is not going to work; but there should be some faith in that an appropriate technology would be coming along the way. Particularly in the UK, there are hundreds of millions of pounds being put into developing technology; so it is not at all gloomy. The next 5 years should see major advances in the technology.

For the Kaipara Harbour project, a costing of $600 million covers the array, sub-sea cables, landslide reticulation and involves 70 km sub-sea cable and 60 km of landside upgrade so lots of reticulation costs associated with it. The economics only works because it is a major project of 200 MW and it is expected to generate a lot of power. The front end loading of capital cannot work with high capital costs for a smaller capacity generation.

A number of environmental issues (concerning the items listed below) are associated with marine turbine projects which the company has to weave into the consent process:

- Harbour bed and entrance.
- Biodiversity issues – the number of sharks.
- Whales and dolphins, with some species rare and endangered hence requiring particular attention.
- Noise factor, hence a number of noise measurements were undertaken.
- Movement of sediments and fish and there may be some complaints (with respect to sediments) that can cause navigational problems.
- Soil Erosion.
- Recreation and commercial fishing.
- Sea-bed ownership, an issue that has proven to be particularly important.

The level of monitoring involved in the project has been major, with the consent process now in its 5th year to get to this point. The process is a very long one and not a quick-fix. Bear in mind that the project has a 10-year lapse period; so that it could take up to fifteen years before a full project gets deployed.

Some of the practical implications for tidal technology providers or turbine manufacturers are really designing them for high yield sites with huge velocity; hence very expensive, high capacity machines. There is not a lot of focus on smaller-scale applications.

In terms of velocity, even the Kaipara with all its attributes is near the lower bound of high-yield sites of the large units that can be deployed but the Kaipara site has some benefits which counter balance these problems.

In the Pacific, a relatively small tidal range means current velocity is generally low; unless there are local features, generally there is not going to be a high current velocity so the big units currently being discussed overseas are not appropriate and not economically viable unless the talk is about 100 MW plus power generation.

There is a technology that would apply in low-yield sites from suppliers such as the Underwater Electric Kite (UEK) and Clean Current Turbine out of Vancouver, Canada. These in-river small lower-yield units are appropriate for a small-scale (even village-scale) generation of some 50 to 100 kW from the lagoon where tidal currents are enclosed and enter in through a narrow channel. There will be opportunity for relatively inexpensive solutions to some of these energy problems so this is something that would be worth looking at.

The second example project is the Chatham Island project. The Chatham is 800 km east off New Zealand with the same longitude as Tonga, one degree further to the west of Tonga and out on its own in the Pacific. Currently it has peak power demand of 500 kW. Currently generating electricity is via diesel generators, hence it is very expensive with associated shipping and storage issues, translating into people paying very high prices for electricity. They currently have a wind project online for implementation soon and at a very early stage but looks very promising.

Chatham Island is on a very high wave energy climate, the chart or figures shows some modelling done by a NZ Company on wave energy flats across the area.
The aim is to find a potential site that faces south west and west of the Pacific Ocean. The potential site (Figure 8) was a rocky shore; falls away very quickly into about 20 m depth water and faces directly south west with all the attributes needed for a proper wave site.

Figure 8 – Left - The wave energy flats modelling study. Right – Chatham potential site.

The technology being considered is the Wave-Gen type of technology (highlighted in the IT Power presentation). It is a shoreline-based facility which involves an oscillation water column unit that captures the up and down movement of waves. This compresses the air and forces it into a turbine which generates electricity. There is no moving part in the water. The unit is very robust as it would need to be and there is a facility in place and operational for over 5 years in Scotland. Whether this technology may be appropriate elsewhere in the Pacific really depends on the site-specific needs and whether the site has got the ‘right’ substrate and geology.

Interestingly with all its benefits, the Chatham project is still not competitive in comparison to wind but using NZ Government grant what is currently required is to make it as competitive as a 200-kW unit.

Other advantages for wave generation are:

- more reliable than wind, with possibility of predicting on a longer term high swells and incident swells;
- that it would supplement wind generation;
- to provide load balancing as wind is highly unpredictable;
- to replace diesel;
- that there would be few environmental effects in this particular location;
- very little effect on marine life and fishing; and
- limited ownership issues.

The concluding comments in terms of environmental effects (a big issue arising in NZ which maybe similar in the Pacific) is the question of seabed ownership something that needs attention right from the outset; so that if developing these units, everybody knows where everyone stands on the occupation of the seabed, a situation no different to the wind power generation considerations. Other issues such as navigation, fishing, noise are all reasonably manageable but requires high costs only because of the onus of the technology; however as the technology use increases, more information would be available and therefore costs should reduce.

For the Pacific, smaller capacity units are more appropriate meaning less than a megawatt, probably in hundreds of kW or less. Most manufactures are looking elsewhere and other directions for commercial reasons but there are some small-scale applications that may be appropriate. Economics are not quite there yet for stand-alone units but this is a function of the maturity of the technology. With a fairly steep development curve, maybe within 3 or 4 years we could see some units in place that could be quite applicable. It makes sense to start now as soon as possible to get resources and information and data together so when technology becomes available, deployment is not hindered.
4. The environmental applications on the Ocean Renewable Energy Technologies by Andrea Athanas, Senior Programme Officer, Energy, Ecosystems and Livelihoods Business and Biodiversity, the World Conservation Union (IUCN).

Both positive and negative implications of offshore renewable energy technologies can affect the well-being and livelihoods of communities who are dependent on the marine environment as well as on the economic development of the Pacific Islands Countries.

The “environmental implications” of renewable energy technologies on the natural systems and their components (ecosystems, habitats and species) were defined and clarified. The findings presented are preliminary findings from an ongoing piece of work which IUCN was doing globally on understanding and managing the environmental impacts of offshore renewable energy options including wind, wave and tidal power. IUCN undertook this work with the support of EON (German based energy company) and SIDA (the Swedish Development Aid Agency). IUCN work included compiling lessons and experiences from existing offshore technologies, particularly wind and oil and gas (platforms), and drew lessons to apply to other technologies which are less widely implemented. The draft report would be finalized in the third quarter this year (2009).

IUCN clarified that its work is raising collective understanding of the implications of offshore renewable energy technologies on the environment and how to manage these implications. The purpose is NOT to stop or slow investments in these important alternatives, but instead to remove barriers to their implementation by helping to build robust frameworks for safeguarding the environment and people’s lives and livelihoods while pursuing these technologies. This, in fact, is the case for all energy work in IUCN – which is about ensuring the potential environmental impacts of all energy options are managed – be it hydro, coal-based, biofuels, oil and gas, nuclear, solar, geothermal or anything else the inspired inventors and entrepreneurs of the energy sector care to dream up!

The environmental implications of an energy technology vary over the lifecycle of the project. IUCN presented three main stages in that lifecycle: construction (which consists of preparing the site, installing the equipment and connecting it to the systems), operation (including regular and extraordinary maintenance requirements), and decommissioning.

Noise was the first impact discussed. At the outset, preparation of the seabed, in case of offshore wave and driving for installations of wind turbines makes a lot of noise, such as from ships used in the construction. During operation, there are lower levels of ongoing noise and some periods of more intense noise from both scheduled and unscheduled maintenance. Much is now known about how noise affects marine mammals, and some information exists on how noise affects fish and birds. Some kinds of noise in certain environments can cause injury to the hearing structures of some species resulting in temporary and, sometimes even permanent damage to individuals within a population. Noise can also drive marine mammals, fish and birds away from an area – making them avoid it on a short-term basis, and sometimes over a longer period of time (even for several years) and this has been documented. This may not be a problem if the site is on the margins of migratory routes, feeding grounds or breeding habitats. But if the site is a central corridor for migration, a critical feeding or breeding ground, it can be a serious issue for the population and (if the species is endemic to the area and/or endangered), that can be a serious issue to the species as a whole. By depriving individuals and populations of food, forcing them to longer migratory routes and/or putting them in higher risk situations (such as breeding in areas where they are more exposed to predators), an offshore energy installation can cause a population of fish or mammals or birds to get tired out, worn down and weaker meaning there are fewer of them and the ones which are left are smaller. This is not good in general and really not good if the population is an important source of food or income for communities or targeted species for local and foreign trawlers which pay governments for the right to fish in the waters, it is also not good if they are the focus of interest of tourists diving and snorkelling off coasts. It can also be of global significance if the species is endemic to the region and endangered or threatened.

Noise is less of an impact for some offshore renewable energy technologies such as wave, tidal and the new generation of offshore wind that have gravitational bases that have less noise implications associated with construction.
On a more positive note, offshore installations can provide habitat for different species. Though the studies are not extensive enough to draw conclusive evidence (for instance, little has been done to understand how installations affect fish with swim bladders – essentially the pelagic species which are important to this region), there is some evidence that installations can act as a no-take zone for fisheries and can act as artificial reefs – thereby creating safe zones for feeding and breeding, and thus increasing the health of the population and individuals.

At the policy level, there is information on which marine environment are more sensitive and important so it is better to avoid technologies or the type of construction that have the most impact or avoid breeding and feeding grounds during installations. However the impacts can be managed, there is a need to safeguard the natural systems which we all depend upon for lives and livelihoods. The key is to enquire and to ask for information in a timely fashion prior to making decisions.

It is encouraging to hear the energy in this group over the last few days for renewable technologies as part of a more sustainable energy future for the region and IUCN supports that transition. But every energy option has the potential to impact the environment and, in turn, affect people and their livelihoods. These impacts can be managed, and people should have the knowledge and experience to effectively manage them. It takes willingness and commitment and a bit of planning ahead to make it happen. IUCN is confident that together ways can be found to safeguard the environment and people in the context of more sustainable energy futures for the Pacific.
## Annex F

### List of Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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</thead>
<tbody>
<tr>
<td>ACP</td>
<td>African-Caribbean-Pacific</td>
</tr>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
</tr>
<tr>
<td>ADEME</td>
<td>Agence de l'Environnement et de la Maîtrise de l'Energie</td>
</tr>
<tr>
<td>ADSIS</td>
<td>Alliance of Small Island States</td>
</tr>
<tr>
<td>AusAID</td>
<td>Australian Agency for International Development</td>
</tr>
<tr>
<td>CCCCC</td>
<td>Climate Community Climate Change Centre</td>
</tr>
<tr>
<td>CDM</td>
<td>Clean Development Mechanism</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>CO2</td>
<td>Carbon Dioxide</td>
</tr>
<tr>
<td>CROP</td>
<td>Council of Regional Organisations of the Pacific</td>
</tr>
<tr>
<td>CSD</td>
<td>Commission on Sustainable Development (of United Nations)</td>
</tr>
<tr>
<td>CTA</td>
<td>Technical Centre for Agricultural and Rural Cooperation</td>
</tr>
<tr>
<td>DNA</td>
<td>Designated National Authority (of CDM)</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>EDF</td>
<td>European Development Fund</td>
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<tr>
<td>EE</td>
<td>Energy Efficiency</td>
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<tr>
<td>EPPSO</td>
<td>Economic Policy Planning and Statistics Office (RMI)</td>
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<tr>
<td>ERP</td>
<td>Enterprise Resource Planning</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>EUEF</td>
<td>European Union Energy Facility</td>
</tr>
<tr>
<td>EUEI</td>
<td>European Union Energy Initiative</td>
</tr>
<tr>
<td>EWG</td>
<td>Energy Working Group (CROP)</td>
</tr>
<tr>
<td>FDC</td>
<td>The Foundation of Development Cooperation</td>
</tr>
<tr>
<td>FEA</td>
<td>Fiji Electricity Authority</td>
</tr>
<tr>
<td>FEMM</td>
<td>Forum Economic Ministers’ Meeting</td>
</tr>
<tr>
<td>FJD</td>
<td>Fiji Dollar</td>
</tr>
<tr>
<td>FIC</td>
<td>Forum Island Country</td>
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<tr>
<td>FIELD</td>
<td>Foundation for International Environmental Law and Development</td>
</tr>
<tr>
<td>FSC</td>
<td>Fiji Sugar Corporation</td>
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<tr>
<td>FSM</td>
<td>Federated States of Micronesia</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GEF</td>
<td>Global Environmental Facility (World Bank-UNEP-UNDP)</td>
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<tr>
<td>GHG</td>
<td>Green House Gas</td>
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<tr>
<td>HIES</td>
<td>Household Integrated Economic Survey</td>
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<tr>
<td>ICR</td>
<td>Independent Corporate Review</td>
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<tr>
<td>IPP</td>
<td>Independent Power Producer</td>
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<tr>
<td>IUCN</td>
<td>International Union for the Conservation of Nature</td>
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<tr>
<td>KSEC</td>
<td>Kiribati Solar Energy Company Ltd</td>
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<tr>
<td>LPG</td>
<td>Liquid Petroleum Gas</td>
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<tr>
<td>MoU</td>
<td>Memorandum of Understanding</td>
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<td>NZ</td>
<td>New Zealand</td>
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<tr>
<td>NZAID</td>
<td>New Zealand Agency for International Development</td>
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<tr>
<td>ODA</td>
<td>Official Development Assistance (of CDM)</td>
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<tr>
<td>O&amp;M</td>
<td>Operations and Maintenance</td>
</tr>
<tr>
<td>OTEC</td>
<td>Ocean Thermal Energy Conversion</td>
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<tr>
<td>PACTAM</td>
<td>Pacific Technical Assistance Mechanism</td>
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<tr>
<td>PCCR</td>
<td>Pacific Climate Change Round Table</td>
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<tr>
<td>PEMM</td>
<td>Pacific Energy Ministers’ Meeting</td>
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<tr>
<td>PESTRAN</td>
<td>Promotion of Environmentally Sustainable Transport in the Pacific Islands</td>
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<tr>
<td>PIC</td>
<td>Pacific Island Country</td>
</tr>
<tr>
<td>REP</td>
<td>Pacific Islands Energy Policy</td>
</tr>
<tr>
<td>REPSAP</td>
<td>Pacific Islands Energy Policy and Strategic Action Planning</td>
</tr>
<tr>
<td>RESAP</td>
<td>Pacific Islands Energy Strategic Action Plan</td>
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<tr>
<td>RFS</td>
<td>Pacific Islands Forum Secretariat</td>
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<tr>
<td>PIGQAREP</td>
<td>Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project</td>
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<tr>
<td>PNG</td>
<td>Papua New Guinea</td>
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<tr>
<td>PPA</td>
<td>Pacific Power Association</td>
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<td>PPAC</td>
<td>Pacific Plan Action Committee</td>
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<td>PREFACE</td>
<td>Pacific Rural Renewable Energy France-Australia Common Endeavour Project</td>
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<td>PRETI</td>
<td>Pacific Renewable Energy Training Initiative</td>
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<tr>
<td>PV</td>
<td>Photo-Voltaic</td>
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<td>RE</td>
<td>Renewable Energy</td>
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<td>REEEP</td>
<td>Renewable Energy and Energy Efficiency Partnership</td>
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<td>REM</td>
<td>Regional Energy Officials’ Meeting</td>
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<td>REP-PoR</td>
<td>Regional Energy Programme for Poverty Reduction</td>
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<tr>
<td>RESCO</td>
<td>Renewable Energy Service Company</td>
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<tr>
<td>RET</td>
<td>Renewable Energy Technology</td>
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<tr>
<td>RIF</td>
<td>Regional Institutional Framework (of the Pacific Plan)</td>
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<tr>
<td>RMI</td>
<td>Republic of the Marshall Islands</td>
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<tr>
<td>ROV</td>
<td>Remotely Operating Vehicle</td>
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<tr>
<td>SEL</td>
<td>Sustainable Energy Limited</td>
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<tr>
<td>SIS</td>
<td>Small Island State</td>
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<tr>
<td>SOPAC</td>
<td>Secretariat for the Pacific Islands Applied Geoscience Commission</td>
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<tr>
<td>SPREP</td>
<td>Secretariat of the Pacific Regional Environment Programme</td>
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<tr>
<td>SRP</td>
<td>Société de Recherche du Pacifique</td>
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<tr>
<td>SURE</td>
<td>Sustainable Use of Renewable Energy</td>
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<tr>
<td>SWAC</td>
<td>Sea Water Air Conditioning</td>
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<tr>
<td>TERI</td>
<td>Tata Energy and Resources Institute</td>
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<td>UEK</td>
<td>Underwater Electric Kite</td>
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<td>UK</td>
<td>United Kingdom</td>
</tr>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<tr>
<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<td>UNESCAP</td>
<td>United Nations Economic and Social Commission for Asia and the Pacific</td>
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<tr>
<td>UNIDO</td>
<td>United Nations Industrial Development Organisation</td>
</tr>
<tr>
<td>USA</td>
<td>United States of America</td>
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<tr>
<td>USP</td>
<td>University of the South Pacific</td>
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<tr>
<td>WB</td>
<td>World Bank</td>
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